

**ENVIRONMENTAL ASSESSMENT/  
DECISION RECORD**

**FOR**

**BENNETT RANCH UNIT #6**

**EA #NM-030-2006-161**

**SEPTEMBER 2008**



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# **BENNETT RANCH UNIT #6**

## **EA #NM-030-2006-161**

### **1.0 INTRODUCTION**

In 1997, a gas find on Otero Mesa resulted in renewed interest on the part of the oil and gas industry in the area. Large increases in the number of lease nominations prompted BLM to review the 1986 White Sands Resource Management Plan (RMP) with regard to guidelines for fluid minerals leasing and development. The BLM determined the 1986 RMP needed to be amended to support large scale leasing. In January 2005, the BLM issued a final *Resource Management Plan Amendment (RMPA) for Federal Fluid Minerals Leasing and Development in Sierra and Otero Counties*, thereby amending the 1986 RMP. The RMPA determined which lands overlying Federal fluid minerals were suitable and available for leasing and subsequent development and how those leased lands were to be managed.

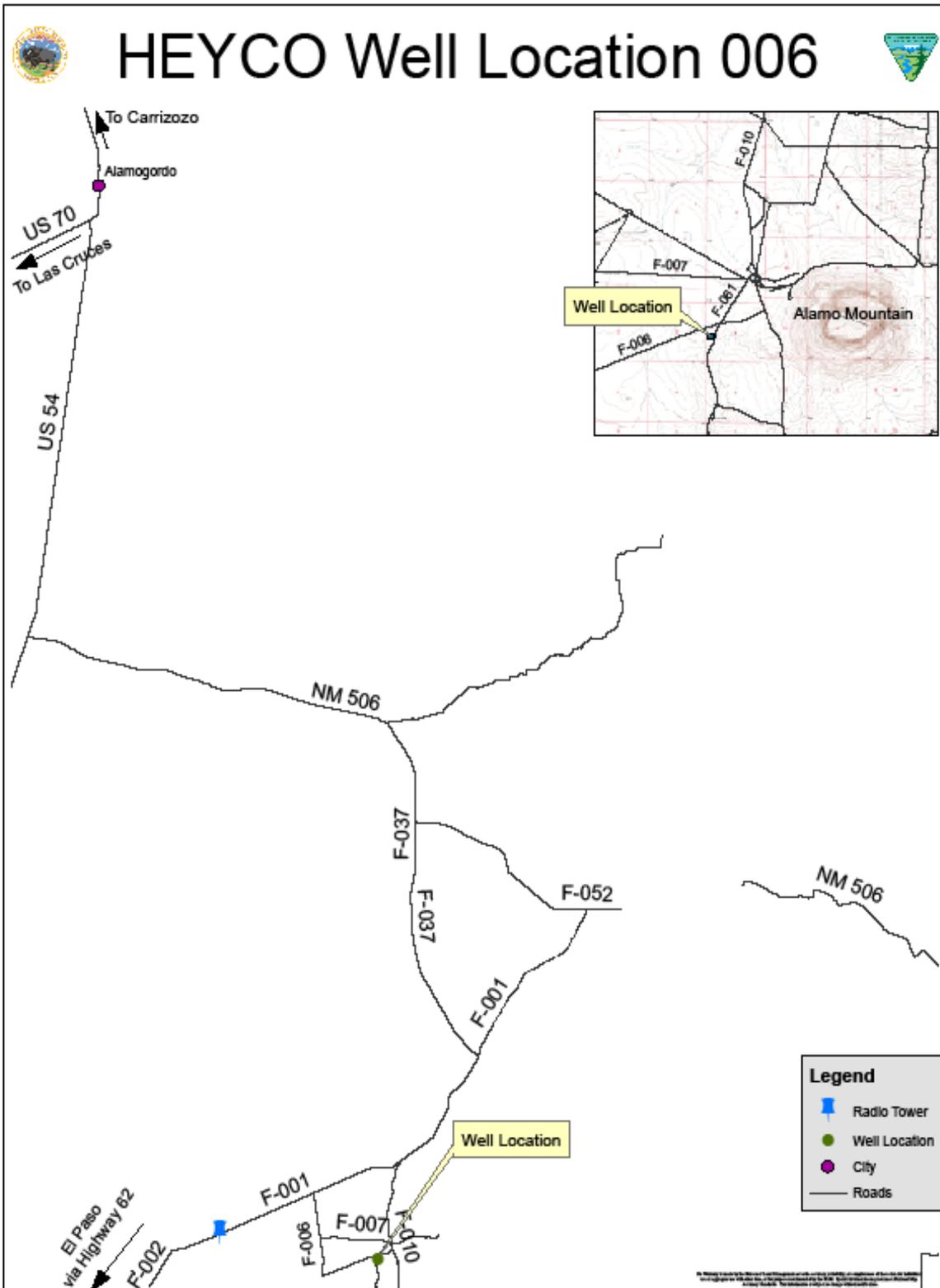
This site-specific analysis tiers to and incorporates by reference the information and analysis contained in the Proposed RMPA/Final Environmental Impact Statement (FEIS) for Federal Fluid Minerals Leasing and Development in Sierra and Otero Counties (December 2003). The RMPA/FEIS is available for review at the Las Cruces District Office. This project Environmental Assessment (EA) addresses site-specific resources and impacts that are not specifically covered in the RMPA/FEIS, as required by the National Environmental Policy Act of 1969 (NEPA), as amended.

The proposed project is located in an area of south-central New Mexico known as the Otero Mesa (Map 1). The area is located in a large expanse of northern Chihuahuan Desert grassland.

Although fluid minerals exploration has occurred on Otero Mesa in the past, there has been no oil field development until recently. Oil and gas exploration has occurred within the area since at least 1925, when the first well was drilled. Since that time 67 wells have been drilled in Otero County. “Shows” of oil or gas (a term indicating the detection of hydrocarbons) were reported for some of the wells; however, extensive field development has not resulted. To date, only two producible natural gas wells exist on Otero Mesa, both of which are currently “shut-in” (a well that is capped but is not plugged and might be used in the future) pending further drilling to determine the extent of the reservoirs, and establishment of reserves sufficient to justify construction of a pipeline.

### **1.1 PURPOSE AND NEED**

The purpose for the proposal is to drill a well for and produce the well if economic quantities of oil or gas are discovered on Federal oil and gas mineral leases issued to the applicant by the BLM. The Mineral Leasing Act of 1920, as amended [30 USC 181 et seq.], authorizes the BLM to issue oil and gas leases and permit the development of those leases. Leases are binding legal contracts that allow development of the mineral by the applicant. The well is being drilled on a lease that was made a part of the Bennett Ranch Unit (BRU), which was established to test a geologic prospect delineated by the applicant. The applicant has already completed two producible gas wells that are currently shut-in. The regulations for unit agreements (43 CFR 3181), require the applicant to timely develop the unit area, or the unit will contract to those areas that are determined to be capable of production in paying quantities. The proposed well is intended to further explore and develop the BRU. An approved Application for Permit to Drill (APD), issued by the BLM, would authorize the applicant to construct a well location and drill the proposed well.



MAP 1- LOCATION OF THE BENNETT RANCH UNIT #6 IN SOUTHERN NEW MEXICO

## **1.2 CONFORMANCE WITH APPLICABLE LAND USE PLAN AND OTHER ENVIRONMENTAL ASSESSMENTS**

This site-specific EA tiers to and incorporates by reference the information and analysis contained in the Proposed RMPA/FEIS for Federal Fluid Minerals Leasing and Development in Sierra and Otero Counties, December 2003, which was approved as the Final RMP for the Las Cruces District Office by the Record of Decision (ROD) signed January 24, 2005. The proposed well is in conformance with the RMPA because it is located within an area identified in that document as open to oil and gas leasing and is within a previously issued Federal lease. The PRMPA/FEIS and ROD are available for review at the Las Cruces District Office. This EA addresses the resources and potential impacts on a site-specific basis as required by the National Environmental Policy Act (NEPA) of 1969. The proposed project would not be in conflict with any local, county, or State plans.

## **1.3 FEDERAL, STATE OR LOCAL PERMITS, LICENSES OR OTHER CONSULTATION REQUIREMENTS**

Under Section 402 of the Clean Water Act (as amended), the U.S. Environmental Protection Agency (EPA), was directed to develop a phased approach to regulate storm water discharges under the National Pollutant Discharge Elimination System (NPDES) program. Industrial activities disturbing land may require permit coverage through a NPDES storm water discharge. Depending on the acreage disturbed, either a Phase I industrial activity (5 or more acres disturbance) or a Phase II small construction activities (between 1 and 5 acres disturbance) permit may be required. Additionally, a U.S. Army Corps of Engineers Section 404 permit for the discharge of dredge and fill materials may also be required. Operators are required to obtain all necessary permits and approvals prior to any disturbance activities.

Compliance with Section 106 responsibilities of the National Historic Preservation Act is adhered to by following the BLM – New Mexico State Historic Preservation Officer protocol agreement, which is authorized by the National Programmatic Agreement between the *BLM*, the *Advisory Council on Historic Preservation*, and the *National Conference of State Historic Preservation Officers*, and other applicable BLM handbooks.

Additionally, the Operator is required to:

- Use a steel tank closed loop mud circulation system unless a waiver (Rule 21 waiver) from the New Mexico Oil Conservation Division for the use of an earthen reserve pit is obtained.
- Comply with all applicable Federal, State and local laws and regulations.
- Obtain the necessary permits for the drilling, completion and production of these wells including water rights appropriations, the installation of water management facilities, water discharge permits, and relevant air quality permits.

## **2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION**

### **2.1 Alternative A - No Action**

The BLM NEPA Handbook (H-1790-1), and NEPA and associated Code of Federal Regulations, states that for EAs on externally initiated proposed actions, the No Action Alternative means that the proposed

activity would not take place. The No Action Alternative is presented for baseline analysis of resource impacts, and if selected, would deny the approval of the proposed application. Current land and resource uses would continue to occur in the proposed project area. No mitigation measures would be required.

If the BLM does not lease these Federal minerals, an assumption is that it is not expected that demand would decrease for oil and gas. Demand would likely be addressed through production elsewhere or imports. Due to less stringent environmental regulations in some areas outside of the U.S., it is possible that there would be increased emissions of volatile organic compounds (VOC), air borne dust, and GHGs during exploration and production operations. In addition, it is anticipated that there would be additional emissions of GHGs during transportation of these commodities to US ports.

It is an assumption that the No Action Alternative (no lease option) may result in a slight reduction in domestic production of oil and gas. This would likely result in reduced Federal and State royalty income, and the potential for Federal lands to be drained by wells on adjacent private or state lands. Consumption of oil and gas developed from the proposed lease parcels is expected to produce GHGs. Consumption is driven by a variety of complex interacting factors including energy costs, energy efficiency, availability of other energy sources, economics, demography, and weather or climate. If the BLM were to forego its leasing decisions and potential development of those minerals, the assumption is that the public’s demand for the resource would not be expected to change. Instead, the resource foregone would be replaced by other sources that may include a combination of imports, fuel switching, and other domestic production. This displacement of supply would offset any reductions in emissions achieved by not leasing the subject tracts.

## 2.2 Alternative B - Proposed Action

The Harvey E. Yates Company (HEYCO) has submitted an Application for Permit to Drill (APD) for an exploratory gas well and associated infrastructure.

### *Proposed Well Information:*

Well Name	Number	Township	Range	Section	Lease Number	Date Lease Issued
BENNETT RANCH UNIT	#6	T 26 S	R 12 E	24	NM71526	03/24/1988

*County:* Otero

*Applicant:* Harvey E. Yates Company

*Surface Owners:* Bureau of Land Management

The Proposed Action involves the development of the project, which includes the following:

- Construction of a 3.7-acre pad and drilling of a gas well to a depth of 6,100 feet.
- No new access roads will be required.
- In the event a producing well is drilled, a tank battery may be constructed on the location.
- In the event a producing well is drilled, a buried gas line approximately 300 feet in length may be constructed beneath the pad to connect the well to a proposed gathering system.

Detailed descriptions of design features and construction practices associated with the Proposed Action are contained in the APD (which is available for review in the Las Cruces District Office). Map 1 shows the location of the proposed well and associated facilities.

The Proposed Action includes construction of a lined earthen reserve pit 170 feet by 100 feet in size as per standard industry practice. However, New Mexico State regulation NMAC 19.15.1.21(B) (Rule 21) prohibits the use of earthen reserve pits at that location. Rule 21 would require the use of a closed loop system of steel tanks to contain fluids during drilling. HEYCO is currently pursuing approval of an exemption to Rule 21 from the State of New Mexico, and the matter remains unresolved at this time. This analysis will address the impacts of both drilling methods. If approved, the APD will be issued contingent upon the operator resolving the reserve pit issue with the State of New Mexico.

### **2.3 Alternative C**

Modifications, or alternatives, to the original proposal received from the operator, were considered during the pre-approval on-site inspection on September 20, 2006. At the on-site, all areas of proposed surface disturbance were inspected to ensure that potential impacts to natural resources would be minimized.

Alternatives to the different aspects of the Proposed Action are always considered and applied as pre-approval changes, site-specific mitigation or Conditions of Approval (COAs), if they will alleviate or minimize environmental impacts of the operator's proposal.

One specific prospective change was identified for the Bennett Ranch Unit #6:

***Moving the well location to a point south of the proposed location in order to avoid creating surface disturbance within the Butterfield Trail controlled surface use area.***

The proposed well location falls within the controlled surface use area which was established 1/4 mile on either side of the Butterfield Trail in the 2005 RMPA for Federal Fluid Minerals Leasing and Development in Sierra and Otero Counties. The RMPA specifies no surface occupancy in this area in order to protect cultural and scenic values associated with the Trail. The proposed location was determined by the operator on the basis of subsurface geologic information without regard to the existence of the controlled surface use area. According to 43 CFR 3101.1-2, "*Measures shall be deemed consistent with the lease rights granted provided that they do not: require relocation of proposed operations by more than 200 meters . . .*" This alternative would move the location 200 meters to the south-southeast, just outside the Butterfield Trail controlled surface use area. The description of the construction details of this alternative are the same as the Proposed Action with the exception of the change in location.

The above change to the Proposed Action will be analyzed as Alternative C and would be incorporated by the BLM as a COA attached to the permit.

### **2.4 ALTERNATIVES CONSIDERED BUT NOT ANALYZED FURTHER**

***Requiring the operator to directionally drill the proposed well from one of the existing wellpads in the area, specifically the 1Y or the 25-1 pad.***

This alternative was considered but determined not to be technically feasible in this case. Directional drilling from existing well pads in the area could be a viable alternative in some circumstances, but not in this instance. In most situations where a high angle directional well is planned, a liquid drilling mud is

used that provides both the necessary lubricity and viscosity to lubricate the drill string and transport the drill cuttings back to the surface, respectively. Many wells of this type require the use of a mineral-oil based fluid to achieve these desired properties. However, in this specific case, directional drilling techniques would not be well suited for the proposed project primarily due to the operator's plan to utilize air and foam as the drilling medium to protect fresh water resources and prevent damage to the potentially productive hydrocarbon horizons. Both the air and foam lack the properties to sufficiently transport (lift) the drill cuttings in the relatively high angle, extended reach borehole to the surface for removal. The cuttings that could not be removed from the borehole would accumulate in what are referred to as cuttings beds and would fall down-hole trapping the drill string. This situation could likely cause problems with the drill string becoming stuck in the borehole, resulting in abandonment. Methods for freeing stuck pipe to prevent the last option of abandonment normally require the use of a diesel based product to sufficiently lubricate the drill string for possible removal. Use of this product would likely cause contamination of fresh water resources in the wellbore. The cutting beds also create problems when running casing into the hole, whereby the casing string may not be able to reach the bottom of the drilled interval to provide the necessary protection for which it is intended. The presence of cutting beds also preclude effective cement coverage around the casing during cementing operations, which may result in a poor quality cement job where channels in the cement sheath provide a conduit for wellbore fluids to migrate up-hole and co-mingle with other horizons in the well.

### **3.0 DESCRIPTION OF AFFECTED ENVIRONMENT**

This section describes the environment that would be affected by implementation of the alternatives described in Section 2. Aspects of the affected environment described in this section focus on the relevant major resources or issues. Certain critical environmental components require analysis under BLM policy. Only those environmental components that may be impacted will be described below (see Table 3.0).

The proposed project is located in an area of south-central New Mexico known as the Otero Mesa (Map 1). This site-specific analysis tiers to and incorporates by reference the information and analysis contained in the Proposed RMPA/Final Environmental Impact Statement (FEIS) for Federal Fluid Minerals Leasing and Development in Sierra and Otero Counties (December 2003).

In addition to the air quality information in the RMPA above, new information about greenhouse gases (GHGs) and their effects on national and global climate conditions has emerged since the RMPA was prepared. On-going scientific research has identified the potential impacts of GHG emissions such as carbon dioxide (CO<sub>2</sub>) methane (CH<sub>4</sub>); nitrous oxide (N<sub>2</sub>O); water vapor; and several trace gasses on global climate. Through complex interactions on a global scale, GHG emissions cause a net warming effect of the atmosphere, primarily by decreasing the amount of heat energy radiated by the earth back into space. Although GHG levels have varied for millennia (along with corresponding variations in climatic conditions), industrialization and burning of fossil carbon sources have caused GHG concentrations to increase measurably, and may contribute to overall climatic changes, typically referred to as global warming.

This EA incorporates an analysis of the contributions of the Proposed Action to GHG emissions and a general discussion of potential impacts to climate.

**TABLE 3.0  
AFFECTED ENVIRONMENT AND BASIS FOR DETERMINATION NO FURTHER ANALYSIS**

<b>RESOURCES</b>	<b>NOT PRESENT</b>	<b>NOIMPACTS</b>	<b>MAY BE IMPACTS</b>	<b>MITIGATION INCLUDED</b>
<b>CRITICAL ELEMENTS OF THE HUMAN ENVIRONMENT</b>				
Air Quality			X	X
Areas of Critical Environmental Concern			X	
Cultural Resources			X	
Native American Religious Concerns		X		
Environmental Justice		X		
Farmlands, Prime or Unique	X			
Floodplains	X			
Invasive, Non-native Species			X	X
Threatened or Endangered Species	X			
Wastes, Hazardous or Solid			X	
Water Quality - Surface/Ground			X	X
Wetlands/Riparian Zones	X			
Wild and Scenic Rivers	X			
Wilderness	X			
<b>NON-CRITICAL ELEMENTS</b>				
General Topography/Surface Geology			X	
Mineral Resources			X	
Paleontology		X		
Soils			X	X
Watershed/Hydrology			X	X
Vegetation, Forestry			X	X
Livestock Grazing			X	X
Special Status Species			X	X
Wildlife			X	X
Wild Horse and Burros	X			
Recreation			X	X
Visual Resources			X	X
Public Health and Safety		X		

### **3.1 Air Resources (Air Quality and Climate)**

Air quality and climate are the components of air resource management, which includes applications, activities, and management of the air resource. Therefore, the BLM must consider and analyze the potential effects of BLM and BLM-authorized activities on air resources as part of the planning and decision making process.

The Environmental Protection Agency (EPA) has the primary responsibility for regulating air quality, including seven nationally regulated ambient air pollutants. Regulation of air quality is also delegated to some states. Air quality is determined by atmospheric pollutants and chemistry, dispersion meteorology and terrain, and also includes applications of noise, smoke management, and visibility. Climate is the composite of generally prevailing weather conditions of a particular region throughout the year, averaged over a series of years.

The proposed well is located in a remote area of Otero County, New Mexico. Air quality in this region is generally good, and the area is not designated by the EPA as a “non-attainment area” for any listed pollutants regulated by the Clean Air Act. The region is designated a Class II air quality area. Class II areas allow for moderate amounts of air quality degradation. Presently, the primary source of air degradation is pm10 (dust) generated off-site during high wind events. These events are fairly common in southern New Mexico, especially during the spring months. Unpaved roads and other disturbed areas are especially susceptible to contributing to fugitive dust during high wind events.

Greenhouse gases, including carbon dioxide (CO<sub>2</sub>) and methane (CH<sub>4</sub>), and the potential effects of GHG emissions on climate, are not regulated by the EPA under the Clean Air Act. However, climate has the potential to influence renewable and non-renewable resource management. The EPA’s Inventory of US Greenhouse Gas Emissions and Sinks found that in 2006, total US GHG emissions were over 6 billion metric tons and that total US GHG emissions have increased by 14.1 percent from 1990 to 2006. The report also noted that GHG emissions fell by 1.5 percent from 2005 to 2006. This decrease was, in part, attributed to the increased use of natural gas and other alternatives to burning coal in electric power generation.

The levels of these GHGs are expected to continue increasing. The rate of increase is expected to slow as greater awareness of the potential environmental and economic costs associated with increased levels of GHG's result in behavioral and industrial adaptations.

#### **3.1.2 Climate**

Global mean surface temperatures have increased nearly 1.0°C (1.8°F) from 1890 to 2006 (Goddard Institute for Space Studies, 2007). However, observations and predictive models indicate that average temperature changes are likely to be greater in the Northern Hemisphere. Without additional meteorological monitoring systems, it is difficult to determine the spatial and temporal variability and change of climatic conditions, but increasing concentrations of GHGs are likely to accelerate the rate of climate change.

In 2001, the Intergovernmental Panel on Climate Change (IPCC) predicted that by the year 2100, global average surface temperatures would increase 1.4 to 5.8°C (2.5 to 10.4°F) above 1990 levels. The National Academy of Sciences (2006) supports these predictions, but has acknowledged that there are uncertainties regarding how climate change may affect different regions. Computer model predictions indicate that increases in temperature will not be equally distributed, but are likely to be accentuated at higher latitudes. Warming during the winter months is expected to be greater than during the summer,

and increases in daily minimum temperatures is more likely than increases in daily maximum temperatures. It is not, however, possible to predict with any certainty regional or site specific effects on climate relative to the proposed lease parcels and subsequent actions.

However, potential impacts to natural resources and plant and animal species due to climate change are likely to be varied, including those in the southwestern United States. For example, if global climate change results in a warmer and drier climate, increased particulate matter impacts could occur due to increased windblown dust from drier and less stable soils. Cool season plant species' spatial ranges are predicted to move north and to higher elevations, and extinction of endemic threatened/endangered plants may be accelerated. Due to loss of habitat or competition from other species whose ranges may shift northward, the population of some animal species may be reduced or increased. Less snow at lower elevations would likely impact the timing and quantity of snowmelt, which, in turn, could impact water resources and species dependant on historic water conditions. Forests at higher elevations in New Mexico, for example, have been exposed to warmer and drier conditions over a ten year period. Should the trend continue, the habitats and identified drought sensitive species in these forested areas and higher elevations may also be more affected by climate change.

In New Mexico, a recent study indicated that the mean annual temperatures have exceeded the global averages by nearly 50 percent since the 1970's (Enquist and Gori). Similar to trends in national data, increases in mean winter temperatures in the southwest have contributed to this rise. When compared to baseline information, periods between 1991 and 2005 show temperature increases in over 95 percent of the geographical area of New Mexico. Warming is greatest in the northwestern, central, and southwestern parts of the state.

### **3.2 Areas of Critical Environmental Concern (ACECs)**

The Proposed Action and alternatives would not be located within any ACEC presently designated by the RMP; however, it is adjacent to the Alamo Mountain ACEC. The Alamo Mountain ACEC contains an estimated 20,000 petroglyphs or images pecked into rock from the Archaic, Jornada Mogollon, Apache, and historic periods.

### **3.3 Cultural Resources**

A cultural resources inventory was conducted for the area of potential effect for this project as proposed. This is documented in the report entitled Archaeological Inventory of 8.26 Acres near Alamo Mountain, Otero County, New Mexico, for the Bennett Ranch Unit #6 Well pad. No historic properties were identified within the area of potential effect.

Six recent cultural resources inventories have been undertaken in the lease area. These are comprised of linear surveys and small block surveys associated with oil and gas explorations and drilling. No historic properties were identified within the areas of potential effect for these projects.

One historic property, the Butterfield Trail (Laboratory of Anthropology Site Number (LA) 131080) is located to the north near the project area. The Butterfield Trail was operative from 1858 to 1861 and is significant because it was the first regular transport route for mail, passengers, and cargo from the United States through its southwestern territories to California. The remains of the Alamo Spring Stage Station, one of many stations to support the Trail, are located approximately 2 miles northeast of the Proposed Action and are a contributing element to the Butterfield Trail.

The Trail trends southwest from the Alamo Springs Stage Station and terminates at County Road F010 to the northeast of the project area. It registers on-the-ground as an observable trace or swale at this

location. The White Sands RMP (1986) provided a ¼-mile buffer of the Trail at this location ending at County Road F010. The Trail then proceeds west as isolated segments immediately south and adjacent to a bladed road. Blading of the road has obliterated much of the Trail; segments remain, but are difficult to discern on-the-ground. This latter section of the Butterfield Trail is directly north of the proposed project area and was given a ¼-mile buffer in the RMPA for Federal Fluid Minerals Leasing and Development in Sierra and Otero Counties (2005).

Although no other prehistoric or historic sites have been recorded within the subject area, it abuts the Alamo Mountain ACEC. The Alamo Mountain ACEC contains an estimated 20,000 petroglyphs or images pecked into rock from the Archaic, Jornada Mogollon, Apache, and historic periods.

### **3.4 Native American Religious Concerns**

A traditional cultural property (TCP) as defined in National Register Bulletin 38

*“...can be defined generally as one that is eligible for the National Register because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community’s history and (b) are important in maintaining the continuing cultural identity of the community.”*

A sacred site as defined by Executive Order No. 13007

*“...means any specific , discrete, narrowly delineated location of Federal land that is identified by an Indian tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion; provided that the tribe or appropriately authoritative representative of an Indian religion has informed the agency of the existence of such a site.”*

In order for the BLM to determine the potential effects of the Proposed Action on traditional cultural properties or sacred sites, the specific locations of these resources as well as information about their relationship to practices or beliefs of a living community must be identified. The BLM must also have the specific, delineated location of a sacred site to avoid adversely affecting the physical integrity of a sacred site at the location specified.

Interested Native American entities were informed of the proposed drilling project by mail on December 13, 2006 as part of the scoping process. Comments received are incorporated in Section 5 of this document. Formal consultation was initiated by certified mail on September 17, 2007. Further scoping will be conducted and comments addressed upon completion of the EA.

Should specific locations and knowledge regarding TCP sacred sites be forthcoming, BLM would keep such information confidential where it is appropriate and has been requested by the Native American entity.

Where specific sacred site locations and their associations are identified, BLM would, in consultation with the interested Native American entity, work to make the changes necessary to accommodate access and ceremonial use of the location and make the changes necessary to avoid adverse effect to the physical

integrity of the scared site location. Where information has been provided concerning a TCP, BLM would evaluate or cause to have evaluated the information provided to determine if it is an historic property and eligible for inclusion on the National Register of Historic Places.

### **3.5 Invasive, Non-native Species**

There are no known populations of noxious weeds within the project area. However, on the adjacent grazing allotment within 10 miles of the project area, there are known populations of African rue. Key characteristics used to identify this perennial species include bushy growth habit, fleshy stems and leaves, and a five-petal white flower. African rue is spread by seed, roots, and root fragments. The known populations exist primarily along the shoulders of county-maintained roads which are the main access routes into the project area.

### **3.6 Wastes, Hazardous or Solid**

There are no known hazardous or solid waste issues in the area of the proposed well.

### **3.7 Water Quality**

#### **3.7.1 Surface Water**

Surface water within the area is affected by geology, precipitation, and water erosion. No perennial surface water is found in the area and surface water occurs primarily as sheet flow during localized storm events. Percolation of surface water into the water table is restricted due to a continuous caliche layer that exists at shallow depth below the surface. Ephemeral surface water within the area may occur within tributaries, playas, and stock tanks.

#### **3.7.2 Ground Water**

Groundwater in the area occurs in basin-fill deposits and in consolidated rock. The basin-fill aquifers consist mainly of unconsolidated to semi-indurated sedimentary deposits. The material is generally of Quaternary and Tertiary ages and ranges from poorly-sorted to moderately-sorted mixtures of gravel, sand, silt, and clay from consolidated rock in the nearby mountain ranges. Evaporite deposits, limestone, conglomerate, and volcanic rocks are present in places. Groundwater in the basins is primarily recharged by ephemeral streams draining the surrounding mountains and discharging either across the permeable alluvial fans at the mouths of the steep canyons or by underflow in these canyons, which enters the alluvial fan directly. Discharge can occur by evapotranspiration, movement to rivers and streams or groundwater withdrawals. Factors that currently affect groundwater resources in the area include management of livestock grazing, groundwater pumping, and possible impacts from brush control treatments. Most of the groundwater in the area is currently used for rural domestic and livestock purposes.

The proposed well is located on the geomorphic feature of Otero Mesa which is the western edge of the Salt Basin and is included in the Basin and Range Province. More importantly, the area is included as part of the Rio Grande Rift. The Rift, by its nature, connotes faulting and fracturing of the rocks both on the surface and subsurface. The proposed well location in the western portion of the Salt Basin is separated from the eastern portion of the Basin by a series of major northwest-southeast trending faults. Sandia Laboratories and the U. S. Geological Survey (USGS) estimate 57 million acre-feet of water lie

under Otero Mesa. Sandia Labs and the USGS used 100 wells for this estimate. However, of the subject wells, only nine are located on or near Otero Mesa. That translates to one well per township in and around the area of the Otero Mesa. Given what is known of Otero Mesa, it is uncertain how much usable water it may contain or where that water occurs.

The two oil and gas wells drilled in the Bennett Ranch Unit Area, the BRU No. 1-Y and the BRU No. 25-1, were drilled using compressed air which allows detection of subsurface natural gas in the well bore. Neither well encountered water above 900 feet. However, the BRU No. 1-Y did encounter usable water below the gas zones at depths around 2,200 feet and 3,600 feet.

Other than the above gas wells, what is known about the water on the Mesa comes from the following water wells in the general area:

T. 26 S., R. 12 E., NMPM  
Sec. 12, well depth – 560 feet; water level 420 feet.  
Sec. 16, well depth – 610 feet; water level 540 feet.

T. 26 S., R. 13 E., NMPM  
Sec. 7, well depth – 560 feet; water level 535 feet.  
Sec. 16, well depth – 800 feet; water level 610 feet.  
Sec. 34, well depth – no data; water level no data

### **3.8 General Topography/Surface Geology**

The topography of the Otero Mesa area is gently rolling terrain with thin to moderate topsoil and scattered surface exposures of caliche. The area is incised by shallow ephemeral drainages. There are occurrences of isolated igneous intrusive features in the Cornudas Mountains to the east. The proposed well is on gently sloping ground with a southern exposure approximately 1 mile west of Alamo Mountain.

### **3.9 Mineral Resources**

With the exception of oil and gas, there are no known mineral resources in the area other than widespread occurrences of caliche. Caliche, a shallow calcium carbonate deposit, is commonly used as a construction material for surfacing roads and well pads.

### **3.10 Paleontology**

The presence and extent of paleontological resources at the site is unknown.

### **3.11 Soils**

The proposed project area occurs primarily on a low, rolling hills landscape typically with shallow soils on and near the crest of the hills and ridges and deeper soils near the bottom of the hills and in the draws. The slope at the proposed location is approximately 4.5 percent. The slope at the alternative location is essentially level.

The soils at the project area site are typically calcareous and shallow over a caliche layer. Soil textures are sandy loam on the surface and a sandy loam or light sandy clay loam subsurface. The cemented caliche layer generally occurs at a depth of 6-20 inches and in some cases may be slightly deeper.

The soils down slope to the south are generally deeper with textures of sandy loam, light sandy clay loam or silt loams. The soils are calcareous throughout and a weakly cemented caliche layer or calcium carbonate coated gravels and cobbles may occur at a depth of 20 to 50 inches.

### **3.12 Watershed – Hydrology**

The watershed and hydrology in the area is affected by land and water use practices. The degree to which hydrologic processes are affected by land and water use depends on the location, extent, timing and the type of activity. Factors that currently cause short-lived alterations to the hydrologic regime in the area include livestock grazing management, groundwater pumping and surface developments such as roads and pipelines.

### **3.13 Vegetation**

In general, the project area is a grassland site with temperature and rainfall that favor warm season perennial plant growth. In years of abundant spring moisture, annual forbs and cool season grasses can make up an important component of the site. Forb production fluctuates greatly from season-to-season and year-to-year.

The dominant range site is Shallow Sandy. This site occurs on upland plains, and tops of low ridges and mesas, associated with Sandy, Loamy Sand, and Shallow sites. The potential plant community consists primarily of grasses such as black grama, blue grama, bush muhly, and sideoats grama. Yucca, cholla cactus, creosotebush and mesquite can also occur on the site. Shrubs, especially mesquite and creosotebush can increase or colonize due to dispersal of seed by livestock or wildlife. This increase may be enhanced by proximity to areas with existing high shrub densities.

This ecological site is within the Southern Desertic Basins, Plains and Mountains Major Land Resource Area (SD-3), and is described by the Natural Resource Conservation Service (NRCS) on their web site: <http://www.nm.nrcs.usda.gov/technical/fotg/section-2/esd.html>

### **3.14 Livestock Grazing**

The project area is located within the Alamo Mountain Allotment No. 09001. The allotment is permitted for 573 cattle and 5 horses. The allotment is fenced into five pastures and a few small traps and is generally run using a “best pasture” approach. This entails continuously evaluating the different pastures as the cow/calf herd is moved from one pasture to another, based on forage conditions. Range improvement projects such as windmills, water delivery systems (pipelines, storage tanks, and water troughs), earthen reservoirs, and fences are located within the project area. In general, the carrying capacity for the project area is about 10 cattle per section.

### **3.15 Wildlife**

The BLM conducted an inventory of wildlife habitats on the Otero Mesa using the Integrated Habitat Inventory and Classification System (IHICS) in 1982. Standard Habitat Sites (SHS) occurring in the proposed well site location include:

- Grass Rolling Upland (approximately 90 percent)
- Grass Flat (approximately 10 percent)

SHS descriptions can be found starting on page 3-21 of the White Sands Resource Area Draft RMP/EIS. The project area provides habitat for approximately 7 species of amphibians, 38 species of reptiles, 63 species of mammals, and 147 species of birds. Wildlife information by habitat type in Otero County is available for review at the BLM Las Cruces District Office.

### **3.16 Special Status Species**

#### **3.16.1 Plants**

Presence of special status plant species and their habitats in Otero County was considered using Las Cruces District species occurrence/habitat records and New Mexico Natural Heritage Program species records. Species descriptions and distributions were derived from Las Cruces District Office records and New Mexico Rare Plant Technical Council (NMRPTC) [1999, New Mexico Rare Plants, Albuquerque, NM: New Mexico Rare Plants Home Page. <http://nmrareplants.unm.edu> (Latest update: 18 January 2006)]. There are no known occurrences of special status plants within the lease boundary.

There is a potential for one sensitive plant species to occur: grama grass cactus, a BLM sensitive plant. Grama grass cactus (*Sclerocactus papyracanthus*) occurs in two ecotypes occurring from 5,000 to 7,300 feet. The two ecotypes include grama and galleta grasslands with sandy soils and alkali sacaton grasslands in gypseous soils.

#### **3.16.2 Animals**

In accordance with BLM Manual 6840, BLM manages certain sensitive species not Federally-listed as threatened or endangered in order to prevent or reduce the need to list them as threatened or endangered in the future. Included in this category are State listed endangered species and Federal candidate species which receive no special protections under the Endangered Species Act.

Special Status animal species lists for Otero County were compiled from U.S. Fish and Wildlife Service and New Mexico Department of Game and Fish websites: ([www.wildlife.state.nm.us/conservation/threatened\\_endangered\\_species/index.htm](http://www.wildlife.state.nm.us/conservation/threatened_endangered_species/index.htm)) and ([http://www.fws.gov/southwest/es/NewMexico/SBC\\_view.cfm?spcnty=Otero](http://www.fws.gov/southwest/es/NewMexico/SBC_view.cfm?spcnty=Otero)) and from the BLM NM/OK/TX/KS Sensitive Species List. Known geographic distribution and habitat requirements were considered for each species in comparison with habitat types in the lease area. The results of this analysis are that of 41 special status species in Otero County, 17 species are considered to have potential habitat within the lease boundary.

Habitat descriptions for these special status wildlife species are available for review at the BLM Las Cruces District Office.

### **3.17 Visual Resources**

The project area appears as an undifferentiated parcel of desert grassland, which is the characteristic landscape of the area. The site does not possess any dominant features that make it stand out in the landscape. There is no sense of boundary restrictions when the site is viewed from points outside of the site.

The project area is within an area designated in the White Sands RMP (October 1986), as Visual Resource Management Class IV. VRM on public land is conducted in accordance with BLM Handbook 8410 and BLM Manual 8411. Class IV designation provides for management activities which allow

<b>TABLE 3.16.1 BLM LAS CRUCES DISTRICT SPECIAL STATUS WILDLIFE SPECIES</b>	
<b>SPECIES</b>	<b>STATUS</b>
Peregrine falcon	FD, FWSS, NMT
Ferruginous hawk	BLMS
Northern aplomado falcon*	FE, NME
Mountain plover	FWSS
Common ground dove	NME
Loggerhead shrike	BLMS
Burrowing owl	BLMS, FWSS
Baird's sparrow	NMT, BLMS, FWSS
Texas horned lizard	BLMS
Western small-footed myotis	BLMS
Cave myotis	BLMS
Long-eared myotis	BLMS
Long-legged myotis	BLMS
Fringed myotis	BLMS
Spotted bat	BLMS, NMT
Townsend's big-eared bat	BLMS, FWSS
Big free-tailed bat	BLMS
<p>NOTES: <b>FD</b>=FEDERAL DELISTED, <b>FWSS</b>=USFWS SPECIES OF CONCERN, <b>NMT</b>=NEW MEXICO THREATENED, <b>BLMS</b>=BLM SENSITIVE, <b>FE</b>=FEDERAL ENDANGERED, <b>NME</b>=STATE OF NM ENDANGERED</p> <p>*The Federally endangered Northern aplomado falcon is currently listed under Section 10J of the Endangered Species Act as an experimental, nonessential population in New Mexico and Arizona. Under this listing, the falcon is treated as a Federally Proposed species, and the BLM must conference with the USFWS on any action that may affect this falcon.</p>	

major modification of the existing landscape. These management activities can focus the view of a casual observer and can dominate the landscape; however, every attempt should be made to minimize the impact of these activities. Changes may subordinate the original composition, but must reflect a natural occurrence.

**3.18 Recreation**

The project area is remote and receives little direct recreational use. Small-game hunting and backcountry driving are the primary recreational uses that take place on-site. The area is also passed through by recreationists en route to Alamo Mountain. The region is visited by people from both New Mexico and Texas.

The Alamo Mountain ACEC was established to protect unique cultural resources that exist there. It is nearby, but outside of the project area and receives a modest amount of public visitation. From the western slope of the ACEC, the project area is within the immediate viewing area, and the southwestern portion of Alamo Mountain is visible from the site. The historic Butterfield Trail, which passes near the project area, attracts a few visitors annually. The proposed sites are not readily visible from the Trail.

## **4.0 ENVIRONMENTAL CONSEQUENCES AND PROPOSED MITIGATION MEASURES**

### **4.0.1 No Action Alternative**

Under the No Action Alternative, the proposed well would not be drilled. There would be no new impacts due to oil and gas exploration/production to the resources in this location. Current land and resource uses in the project area would continue unaffected by oil and gas activity at this site. The No Action Alternative will not be evaluated further in Chapter 4.

### **4.0.1 Alternative B**

Under Alternative B (Proposed Action), the well would be drilled as proposed. Descriptions of potential impacts on individual resources for this alternative are presented in the following text. Also described are mitigation measures that could be incorporated by the BLM where appropriate as Conditions of Approval attached to the permit.

### **4.0.1 Alternative C**

Under Alternative C, the well would be drilled as originally proposed with the exception of changing the location to a point approximately 200 meters to the south-southeast. Total surface disturbance under this alternative would remain the same as under Alternative B. Descriptions of potential impacts on individual resources for this alternative are presented in the following text. Also described are mitigation measures that could be incorporated.

## **4.1 Air Resources (Air Quality and Climate)**

*Alternative B:* Air quality would temporarily be impacted by pollution from exhaust emissions, chemical odors, and dust that would be caused by the motorized equipment used to construct the well pad, reserve pit, and by the rotary drilling rig itself. No new access roads would be needed, but traffic to and from the drill site would raise dust on existing dirt roads in the area. Dust dissemination would be greatly reduced upon completion of the construction phase of the well pad. Air pollution from the motorized heavy equipment would discontinue entirely upon completion of the drilling phase of the operation. Winds generally disperse odors and emissions. The impact to air quality would become greatly reduced when the construction phase is completed. Air quality impacts would cease altogether at the end of the drilling activity, which is estimated to last for 60 days. The RMPA quantifies fugitive dust emissions expected to result from drilling activities in terms of total suspended particulates (TSP). TSP is estimated at approximately 10 tons during a 30-day per well pad construction and drilling period.

If steel tanks are used in place of a reserve pit, air quality impacts during the construction phase would be the same except for an incremental reduction in dust impacts because an earthen pit would not be dug.

Dust impacts would continue during the drilling operation and be increased because of increased truck traffic to and from the well site. While the well bore is being advanced, the steel circulation tanks must be emptied regularly into a tank truck to maintain the chemical composition of the fluid and remove cuttings. This material would have to be hauled off-site to an approved disposal facility.

Drilling would contribute a small incremental increase in overall hydrocarbon emissions, including GHGs, released into the planet's atmosphere. When compared to total national or global emissions, the amount released as a result of drilling this one well would not have a measurable effect on climate change.

Consumption of oil and gas developed from the proposed well is expected to produce GHGs. Consumption is driven by a variety of complex interacting factors including energy costs, energy efficiency, availability of other energy sources, economics, demography, and weather or climate. If the BLM were to forego potential development of the well, the public's demand for the resource would not be expected to change. Instead the resource foregone would be replaced by other sources that may include a combination of imports, fuel switching, and other domestic production. This displacement of supply would offset any reductions in emissions achieved by not authorizing the well.

The assessment of GHG emissions and climate change is in its formative phase. It is currently not feasible to know with certainty the net impacts to climate due to global emissions. The inconsistency in results of scientific models used to predict climate change at the global scale coupled with the lack of scientific models designed to predict climate change on regional or local scales, limits the ability to quantify potential future impacts of decisions made at this level. When further information on the impacts to climate change is known, such information would be incorporated into the BLM's planning and NEPA documents as appropriate.

*Alternative C:* Impacts to air quality under Alternative C would be the same as those under Alternative B.

#### **4.1.1 Mitigation**

The EPA's inventory data breaks down the total US sources of GHG gases by major categories that include "Natural Gas Systems" and "Petroleum Systems." The inventory lists the contributions of natural gas and petroleum systems to total CO<sub>2</sub> and CH<sub>4</sub> emissions (natural gas and petroleum systems do not produce noteworthy amounts of any of the other greenhouse gases). For Natural Gas Systems, the EPA categorizes emissions from distinct stages of the larger category of natural gas systems. These stages include field production, processing, transmission and storage, and distribution. The BLM has regulatory jurisdiction only over field production. Petroleum Systems sub-activities include production field operations, crude oil transportation, and crude oil refining. Within the petroleum systems emission categories, the BLM has authority to regulate production field operations.

The BLM's regulatory jurisdiction over field production of Natural Gas Systems and production field operations of Petroleum Systems has resulted in the development of "Best Management Practices (BMPs)" designed to reduce impacts to air quality by reducing all emissions from field production and operations. The future development of the lease parcels may be subject to appropriate conditions of approval (COAs) to reduce or mitigate GHG emissions. This may occur at the project level through additional analysis. Specific measures developed at the project stage would be incorporated as COAs in the approved APD, which are binding on the operator. Typical measures may include: flare hydrocarbon and gases at high temperatures in order to reduce emissions of incomplete combustion; water dirt roads during periods of high use in order to reduce fugitive dust emissions; require that vapor recovery systems be maintained and functional in areas where petroleum liquids are stored; and revegetate areas of the pad not required for production facilities to reduce the amount of dust from the pads.

The EPA data show that improved practices and technology and changing economics have reduced emissions from oil and gas exploration and development (Inventory of US Greenhouse Gas Emissions and Sinks: 1990-2006). One of the factors in this improvement is the adoption by industry of the Best Management Practices proposed by the EPA's Natural Gas Energy Star program. The Roswell Field Office will work with industry to facilitate the use of the relevant BMPs for operations proposed on federal mineral leases where such mitigation is consistent with agency policy.

## **4.2 Areas of Critical Environmental Concern**

The Alamo Mountain ACEC lies approximately 2 miles northeast of both the proposed and alternative well location. Either location may be visible from higher elevations on Alamo Mountain; however, no other impacts to the ACEC are anticipated.

### **4.2.1 Mitigation**

Mitigation is not required.

## **4.3 Cultural Resources**

*Alternative B:* The proposed well is located within Federal lease number NMNM-71526 which was issued on March 24, 1988 under the provisions of the White Sands RMP (October 1986). The White Sands RMP identified a number of well-preserved segments of the Butterfield Trail to be protected by a ¼-mile buffer either side of the trail where no surface occupancy is allowed. However, the proposed well location is outside the ¼-mile buffer identified in the White Sands RMP.

The White Sands RMP was amended by the January 2005 RMPA for Federal Fluid Minerals Leasing and Development in Sierra and Otero Counties. The RMPA extended the ¼-mile buffer along the entire length of the Butterfield Trail through Otero County. While the project location is within the newly identified buffer zone, no stipulations in regard to the Butterfield Trail were included in Lease number NMNM-71526 at the time of issuance. Additionally, the proposed location would not be visible from the Butterfield Trail. Therefore, no impacts to the trail are expected under this alternative.

The project location is within the ¼-mile Butterfield Trail buffer as designated in the White Sands RMP and the 2005 RMPA. However it sits at a lower elevation than the Trail and *would not be* visible from the Butterfield Trail. This falls within the exception (B-6) provided in the decision which allows surface disturbance within the buffer that is not visible from the Trail.

*Alternative C:* No surface disturbance under alternative C would occur within the ¼-mile buffer of the Butterfield Trail as defined in either the White Sands RMP or the 2005 RMPA. However, the well pad *would be* visible from the Butterfield Trail.

Any area to be disturbed by drilling and construction operations would receive cultural clearances prior to any ground disturbance occurring. Any historic property or sacred site identified during clearance surveys would be avoided. No direct or indirect adverse effects to cultural resources are anticipated.

### **4.3.1 Mitigation**

Mitigation is not required.

## **4.4 Native American Religious Concerns**

No impacts to Native American religious concerns are anticipated to result from either alternative.

### **4.4.1 Mitigation**

Mitigation is not required.

## **4.5 Invasive, Non-native Species**

*Alternative B:* Although there are no known weed populations in the actual project area, there are known populations along the shoulder of the main access routes into the project area. Weed seeds could be picked up on the wheels of equipment and carried into the project area. Ground disturbing activities associated with roads and drill pads would create a favorable environment for the establishment and spread of noxious weeds. If noxious weeds are detected, abatement measures would be implemented. These include weed inventory surveys, weed monitoring programs, and a control program.

Impacts from and mitigation for invasive, non-native species would be the same for steel tanks as for earthen pits.

*Alternative C:* Impacts to invasive, non-native species under Alternative C would be the same as Alternative B.

### **4.5.1 Mitigation**

The operator will be required to prevent/control any infestations of noxious weeds associated with the proposed operation. The following measures will be attached to any authorization of the APD as COAs:

- The BLM will determine the size and density of the noxious weed infestations requiring implementation of a control program.
- Mechanical, chemical, biological, or other methods approved by the BLM will be used to control infestations of noxious weeds in disturbed areas.
- The operator shall employ measures to prevent seed transport into relatively weed-free areas. These measures shall include surveillance of access routes and removal of weed sources that could be picked up and transported by passing vehicles, and washing vehicles prior to entering the project area and before leaving infested areas.

## **4.6 Wastes, Hazardous or Solid**

*Alternative B:* The lease action falls under Federal and State environmental regulations that impose responsibility and liability on the operator for the protection of human health and the environment from harmful waste management practices or discharges. These regulations ensure that adequate procedures are in place to provide for the safe handling and disposal of any drilling fluids, additives, cuttings or saline water used or produced during drilling operations.

The New Mexico Oil Conservation Division Rule 21 requires a closed loop system. The applicant has requested a waiver from those regulations.

*Alternative C:* Impacts to solid or hazardous wastes under Alternative C would be the same as Alternative B.

#### **4.6.1 Mitigation**

Mitigation is not required.

### **4.7 Water Quality**

#### **4.7.1 Surface Water**

*Alternative B:* If a Rule 21 waiver is granted, circulating fluid in an earthen drilling pit would be contained by a soil berm. There is a risk that this berm may leak or break, releasing fluids off the well site. There are no nearby surface waters in the area, and the site is approximately 300 feet from the head of a normally dry drainage. There is a remote possibility that the reserve pit could be compromised if a leak were to occur during a heavy rain event. If steel tanks are used, impacts to surface water from circulating fluids would not occur unless an unanticipated water flow was encountered causing the tanks to overflow. The proper use of blow out prevention and pressure control equipment along with the construction of earthen berms surrounding the tanks would mitigate this impact.

Surface disturbance from the construction of the well pad and ancillary facilities can result in minor degradation of surface water quality and groundwater quality from non-point source pollution, increased soil losses, and increased gully erosion.

Potential direct impacts that would occur due to construction of the well pad include increased surface water runoff and off-site sedimentation brought about by soil disturbance, increased salt loading and water quality impairment of surface waters and possible contamination of surface waters by produced water. The magnitude of these impacts to water resources are expected to be minor and would depend on the proximity of the disturbance to the drainage channel, slope aspect and gradient, degree and area of soil disturbance, soil character, duration and time within which construction activity would occur, and the timely implementation and success or failure of mitigation measures.

Direct impacts would likely be greatest shortly after the start of construction activities and would likely decrease in time due to natural stabilization and reclamation efforts. Construction activities would occur over a relatively short period; therefore, the majority of the disturbance would be intense but short lived. Direct impacts to surface water quality would be minor, short-term impacts which may occur during storm flow events. Indirect impacts to water-quality related resources, such as fisheries, would not occur.

Petroleum products and other chemicals, accidentally spilled, could result in surface and groundwater contamination. Similarly, possible leaks from reserve and evaporation pits could degrade surface and ground water quality. Authorization of the proposed projects would require full compliance with BLM directives and stipulations that relate to surface and groundwater protection.

*Alternative C:* Impacts to surface water quality under Alternative C would be the same as Alternative B.

##### **4.7.1.1 Mitigation**

If a Rule 21 waiver is granted by New Mexico Oil Conservation Division, an approved plastic-lined reserve pit will be required which will prevent seepage of drilling fluid into the soil and eventually reaching groundwater. Spills or produced fluids (e.g., saltwater, oil, and/or condensate in the event of a breach, overflow, or spill from storage tanks) could result in contamination of the soil on-site, or off-site, and could potentially impact surface and groundwater resources in the long-term.

## **4.7.2 Groundwater**

*Alternative B:* There is a remote possibility that accidental contamination of soils and groundwater by drilling fluids (seepage) could occur during the drilling phase. There is the possibility that seepage from an earthen pit would occur. After drilling operations, all drilling material would be left on-site within the reserve pit and buried. There is the long-term potential for groundwater contamination from water infiltration at the reserve pit location. This potential would be minimized by the use of an approved impermeable pit liner to contain pit contents. The potential impact to groundwater could be further mitigated if the pit contents were removed prior to closure of the pit.

If steel tanks are used, the possibility that drilling fluid contamination could occur during the drilling phase is more remote than with earthen pits. If this happens, the effects would be minimal because steel tanks would be used to contain drilling fluids and protect soils and groundwater from mud contamination and seepage. There is the potential for drilling fluids, cuttings, and returns to exceed the capacity of the steel tanks, in which case, contamination could still occur to soils and groundwater. This impact would be mitigated with the proper use of blow out prevention and pressure control equipment.

The useable groundwater could be contaminated by cross formation or intra-formational invasion of salt water whether from an aquifer or as produced (salt) water in association with hydrocarbons. In addition, drilling with mud systems containing toxic chemicals and the like could also invade useable aquifers.

*Alternative C:* Impacts to groundwater under Alternative C would be the same as Alternative B.

### **4.7.2.1 Mitigation**

The casing and cementing requirements imposed on the proposed well will reduce or eliminate the potential for groundwater contamination from drilling muds and other surface sources. Onshore Order No. 1 clearly requires the BLM to protect both known and potential occurrences of useable water. Drilling with air or fresh water mud systems eliminates contamination of the useable water by drilling mediums. Setting surface or intermediate casing below the last known useable water and cementing the casing to surface reduces or eliminates the potential for groundwater contamination from drilling mud and other surface sources. Based on the best available data derived from local water wells as shown in 3.10 above, the BLM will require the operator to set surface casing to a depth of at least 900 feet to protect useable groundwater sources.

In the event that the operator receives a Rule 21 waiver from the New Mexico Oil Conservation Division and employs an earthen reserve pit, an approved plastic-lined reserve pit will be required which would prevent seepage of drilling fluid into the soil.

## **4.8 General Topography/Surface Geology**

The surface disturbance anticipated from the construction of the well pad would have minimal impacts on the area of the operations. No major land or soil displacement would occur from the operations associated with drilling the well.

*Alternative B:* Direct impacts would result from the removal of the surface soils during construction of the well pad. The consequential earth moving activities would indirectly impact the vegetation and would cause a degree of fragmentation of the surface habitat where small animals live in the project area.

*Alternative C:* Impacts to general topography/surface geology under Alternative C would be the same as Alternative B.

#### **4.8.1 Mitigation**

The inclusion of mitigation measures to conserve the landscape to the extent possible, such as limiting the size of the disturbed area, in the COA will lessen the impacts from the surface disturbance activities on this project.

#### **4.9 Mineral Resources**

Mineral resources are classified by the BLM as salable, locatable, and leaseable. Each of these types of resources may be extracted under their applicable authorities.

*Alternative B:* Construction materials, considered salable, may be used onsite for construction of the well pad as authorized by the provisions for sundries in 43 CFR 3100. These materials would not be removed from the site and would remain once the well pad is reclaimed. No locatable minerals are known to occur within the area of the Proposed Action, nor are there any active mining claims. Leaseable minerals include oil and gas which would be impacted through extraction.

Placement of the well pad would tend to physically impede the exploitation of mineral resources other than oil and gas if they existed beneath it. However, as there are no known resources besides oil and gas beneath the proposed well pad, it is unlikely that any such conflict would exist.

*Alternative C:* Impacts to mineral resources under Alternative C would be the same as Alternative B.

#### **4.9.1 Mitigation**

No mitigation is required.

#### **4.10 Paleontology**

No known direct and indirect impacts would occur from either alternative.

#### **4.11 Soils**

*Alternative B:* The construction of the well pad would physically disturb about 3.7 acres of topsoil material. No additional access road construction is anticipated because the well site is directly adjacent to an existing county road. Where exposed, soils would be susceptible to wind and water erosion. This impact could be remedied upon reclamation when the well pad is reseeded. An earthen reserve pit, if improperly constructed, could take longer to reclaim than the surrounding area due to the well bore fluids contained in the pit. However, BLM standards require that all earthen pits be constructed in 100 percent cut material and use an impermeable liner. Following complete drying of the pit fluids, the liner is folded over the top encapsulating the pit contents. Since the pit is constructed in cut material (below the original grade), the soil depth above the former reserve pit after recontouring is sufficient to prevent any impacts to revegetation success.

If steel tanks are used, the area of surface disturbance and attendant construction impacts would be the same because the well site layout and the need for level space would not be reduced even though steel tanks would take up less area on the pad than earthen pits. There would be no below-grade disturbance of soils caused by a dug pit. Circulating fluids would be contained in steel tanks, reducing the risk of reclamation problems in the area of the circulating tanks.

The construction of the well pad and reserve pit would physically disturb about 3.7 acres of topsoil and would expose the substratum soil. Direct impacts resulting from construction of the well pad and reserve pit include removal of vegetation, exposure of the soil, mixing of horizons, compaction, loss of top soil productivity and susceptibility to wind and water erosion. Wind erosion would be expected to be a minor contributor to soil erosion with the possible exception of dust from vehicle traffic. These impacts could result in increased indirect impacts such as runoff, erosion and off-site sedimentation. Activities that could cause these types of indirect impacts include construction and operation of well sites and facilities.

Contamination of soil from drilling and production wastes mixed into soil or spilled on the soil surfaces could cause a long-term reduction in site productivity. Some of these direct impacts can be reduced or avoided through proper design, construction and maintenance and implementation of best management practices.

*Alternative C:* Impacts to soils under Alternative C would be the same as Alternative B.

#### **4.11.1 Mitigation**

The operator will construct the well pad in such a way that limits the overall surface disturbance to the minimum area practicable. In addition, the operator will stockpile the topsoil from the surface of the well pad which will be used for surface reclamation of the well pad. During reclamation of the well pad, stockpiled soil will be distributed over the well pad to form a seed bed and reestablish vegetation.

If a reserve pit is constructed, it shall be recontoured and reseeded as described in the attached COAs. Upon abandonment of the well, the Authorized Officer shall issue instructions or orders for surface reclamation/restoration of the disturbed areas as described in the COA.

#### **4.12 Watershed - Hydrology**

*Alternative B:* Construction and surface disturbance activities from the construction of the well pad can result in long-term and short-term alterations to the hydrologic regime. The potential hydrologic effects include reduced infiltration, bank erosion and channel widening

Long-term direct and indirect impacts to the watershed and hydrology would continue for the life of the well and would decrease once all well pad and road surfacing material has been removed and reclamation of the well pad has taken place. Short-term direct and indirect impacts to the watershed and hydrology from access roads that are not surfaced with material would occur and would likely decrease in time due to reclamation efforts.

*Alternative C:* Impacts to watershed/hydrology under Alternative C would be the same as Alternative B.

#### **4.12.1 Mitigation**

The operator shall stockpile the topsoil from the surface of the well pad which will be preserved for later surface reclamation of the disturbed area. If the operator receives approval from the State of New Mexico to construct a reserve pit, the pit shall be recontoured and reseeded as described in the COAs. Upon abandonment of the well or when the access road is no longer in service, the Authorized Officer shall issue instructions or orders for surface reclamation/restoration of the disturbed areas as described in the COAs.

## **4.13 Vegetation**

*Alternative B:* The construction of the well pad would require removal of about 3.7 acres of native vegetation to accommodate drilling and well completion equipment. Following well completion, the pad would be reduced in size to approximately 2.2 acres and the remaining 1.5 acres reclaimed. If it is a producing well, full reclamation would not commence until the well is a depleted producer and plugged and abandoned. Vegetative recovery of the well pad would depend on the life of the well. Native vegetation, which currently consists primarily of blue grama with a creosotebush overstory, would encroach on the well pad over time with only high traffic areas remaining un-vegetated. If drilled as a dry hole and plugged, reclamation of the well pad would immediately follow. Vegetative impacts would be short-term when the access road and well pad are re-vegetated within a few years, and reclamation of the well pad is successful. Impacts to and mitigation for vegetation would be the same regardless of whether earthen pits or steel tanks are used.

*Alternative C:* Impacts to vegetation under Alternative C would be the same as Alternative B.

### **4.13.1 Mitigation**

No long-term impact to vegetation is anticipated. Revegetation measures by the operator will continue for as long as necessary until the site is fully recovered.

## **4.14 Livestock Grazing**

*Alternative B:* The construction of pads, pits, and associated facilities would cause forage to be lost on affected BLM grazing allotments. On average, approximately 65 acres of forage are required to support one cow in this region. Using this figure and the extent of actual disturbance anticipated, adverse impacts to grazing are expected to be minimal and would not require adjustments to grazing permits.

In addition to forage loss there could be occasional livestock injuries or deaths due to accidents such as collisions with vehicles, falling into mud pits or other excavations, and ingesting plastic or other materials present at the work site. These impacts make the day-to-day livestock management actions more difficult. Impacts to and mitigation for livestock grazing would be the same regardless of whether earthen pits or steel tanks are used.

*Alternative C:* Impacts to livestock grazing under Alternative C would be the same as Alternative B.

### **4.14.1 Mitigation**

If conflicts arise with livestock as a result of construction of the well pad, measures will be taken as necessary to mitigate those conflicts in coordination with the allottee and the Authorized Officer. Mitigation measures will likely include fencing the well pad to exclude livestock, dust abatement and road maintenance.

## **4.15 Wildlife**

*Alternative B:* Development of the well would have impacts on wildlife habitat and populations. Mechanisms through which oil and gas activities impact wildlife and wildlife habitats include:

- Altered vegetation structure
- Altered fire regime
- Alteration of soil structure
- Alteration of water regimes
- Increased human and vehicular activity

The development of this location would lead to the loss of approximately 4 acres of wildlife habitat due to construction of the wellpad. If the well is a dry hole, the affected area would be reclaimed within 2 to 3 years. If the well proves successful, the loss of habitat would continue for the production life of the well.

*Alternative C:* Impacts to wildlife and wildlife habitats under Alternative C would be the same as Alternative B.

#### **4.15.2 Mitigation**

Mitigation is not required.

#### **4.16 Special Status Species**

*Alternative B:* Grama grass cactus (*Sclerocactus papyracanthus*): BLM Sensitive plant species. This cactus could be impacted by equipment and vehicles during development.

American peregrine falcon (*Falco peregrinus anatum*): Development is not anticipated to preclude this species from occurring.

Ferruginous hawk (*Buteo regalis*): There is suitable feeding habitat for ferruginous hawks that may winter on the proposed well site. Development at levels that maintain adequate prey resources (rodents and rabbits) for this hawk would not have significant adverse impacts.

Northern aplomado falcon (*Falco femoralis septentrionalis*): The northern aplomado falcon habitat model indicates that the proposed development would be in high potential habitat for aplomado falcons. Surveys for aplomado falcons have been conducted during the breeding season by two separate contract biologists for the past several years. The proposed well site is adjacent to an established survey route. Although recent sightings have occurred in spring 2006 and 2007, follow-up surveys have not resulted in additional sightings, nesting activity, or evidence of established territories within the project area.

The proposed well site is located within the Bennett Ranch Unit Agreement Area (approved March 4, 1997). Consultation with USFWS has occurred for five previous APDs within the Bennett Ranch Unit (Bennett Ranch Wells 2-5, cons. #2-22-98-I-348 and Bennett Ranch Well 25-1, cons. #2-22-00-I-499) and the Bennett Ranch Pipeline Gathering System (cons. #2-22-01-F-F373). The USFWS concurred with BLM's determination that the proposed wells "may affect, but not likely adversely affect" the aplomado falcon contingent on measures to minimize impacts. Mitigation measures included: 1) minimizing pad size where possible, 2) locating access roads and drill pads to avoid likely nest sites, such as large yuccas, and 3) conducting falcon surveys 2 weeks prior to any construction activity during the falcon breeding season (February 1- July 31). The same falcon survey requirement was included in the Proposed Action for the Bennett Ranch Pipeline Gathering System. The USFWS issued a Biological Opinion stating the Proposed Action would not jeopardize the continued existence of the aplomado falcon. Mandatory terms and conditions included: 1) locating pipeline to minimize disturbance to nest structures, 2) reclaim to prevent establishment of permanent roads, and 3) minimizing attracting potential nest predators.

Only one of the above referenced wells was ever drilled and development of the Bennett Ranch Pipeline Gathering System has not begun to date. The Sierra Otero Fluid Minerals RMPA/EIS included analysis of the Bennett Ranch field development as well as other potential fields. Development of three fields and associated infrastructure was specified in the Reasonable and Foreseeable Development scenario and analyzed in the EIS. The USFWS concurred that the RMPA Proposed Action “may affect, but is not likely to adversely affect” the aplomado falcon with the following rationale:

1. Aplomado falcon sightings are rare.
2. Most recent sighting on Otero Mesa, off military land, was in 2001.
3. No aplomado nesting is known to occur in Sierra or Otero County.
4. Core areas and core area corridors have been withheld from leasing.
5. BMPs and conservation measures/stipulations included in the Bennett Ranch Gathering System BO remain part of the plan.
6. It is unlikely that oil/gas development at the proposed levels in the grasslands would impact aplomado falcons that rarely occur in the area.
7. BLM proposes to conduct annual pre and post nesting season falcon surveys in the core areas.

The proposed BRU#6 well is in close proximity to one of the earlier proposed well sites that were never drilled. A site examination by the Las Cruces District Office biologist has verified that the well site would not disturb potential nest structures (trees or multi-branched yuccas).

The proposed action “may affect, but is not likely to adversely affect” the aplomado falcon based on the following rationale:

1. The proposed well site would not disturb potential nest sites.
2. On-going falcon surveys adjacent to the proposed well site have resulted in isolated falcon sightings but no nest sites or established territories have been documented within the project area.
3. Previous consultations with USFWS for proposed wells in the Bennett Ranch Unit have resulted in concurrence with a “may affect, not likely to adversely affect” determination for aplomado falcon contingent on the same measures to minimize impacts as outlined below under mitigation measures.

Aplomado falcons were designated a nonessential experimental population on July 26, 2006, under section 10(j) of the Endangered Species Act. For BLM, species with this designation are considered a “proposed” species for purposes of compliance with Section 7 of the Act. BLM NM/OK/KS/TX policy (IM NM 2007-12) states that for BLM actions that May Affect, Not Likely to Adversely Affect a proposed species, BLM is only required to send an informational courtesy letter to the Fish and Wildlife Service (FWS) that describes the action and documents the thought process to support the effect determination. BLM would confer with the FWS and/or National Marine Fisheries Service (NMFS) on any action that is likely to adversely affect a proposed species or proposed critical habitat.

Mountain plover (*Epode montana*): There are no prairie dog towns that could provide potential mountain plover habitat on the proposed well site. Clearing of the well site may enhance mountain plover habitat on a temporary basis when human activity is lacking.

Common ground dove (*Columbina passerina pallescens*): Implementation of the Proposed Action is anticipated to reduce seeds available to birds including the common ground dove.

Loggerhead shrike (*Lanius ludovicianus*): Fluid mineral development is anticipated to provide adequate habitat for loggerhead shrikes.

Burrowing owl (*Athene cunicularia hypugaea*): There are no known prairie dog towns that provide potential burrowing owl habitat in the lease area.

Baird's sparrow (*Ammodramus bairdii*): Development activities must be managed at levels that maintain grasslands, both as cover and seed sources for these sparrows.

Texas horned lizard (*Phrynosoma cornutum*): Development can have direct impacts on these lizards, since they move slowly enough that they are susceptible to vehicle mortality. Surface disturbance reduces grass seed availability, which is the food of harvester ants upon which Texas horned lizards feed, so development has a net detrimental impact on these lizards.

Western small-footed Myotis (*Myotis ciliolabrum melanorhinus*), cave myotis (*Myotis velifer*), long-eared myotis (*Myotis evotis*), long-legged Myotis (*Myotis volans*), fringed myotis (*Myotis thysanodes*), spotted bat (*Euderma maculatum*), Townsend's big-eared bat (*Corynorhinus townsendii pallescens*), big free-tailed bat (*Nyctinomops macrotis*). Development would likely reduce bat food (insects) on the landscape as a whole, and human activity may cause these bats to avoid feeding on or near the proposed well pad.

*Alternative C*: Impacts to special status species under *Alternative C* would be the same as *Alternative B*.

#### **4.16.1 Mitigation**

Based on previous informal consultation with the USFWS, site mitigation measures for the aplomado falcon will include:

- Minimize pad size as much as possible
- Net any open pits to prevent bird mortality
- Locate the pad away from potential nest sites (tall, multi-branched yuccas and tree-form mesquites with raptor nests)
- Conduct further NEPA analysis and Section 7 Conference for commercial production proposals

BLM and other contractors have conducted surveys for aplomado falcons within the Bennett Ranch Unit for the past several years and during processing of this APD. Isolated falcon sightings have occurred during spring 2006 and 2007. However, follow-up surveys have not resulted in additional sightings, nesting activity, or evidence of established territories within the project area. If construction of roads and well pads occurs during the nesting season for aplomado falcon (February 1 – July 31) additional surveys will be required within 2 weeks of construction. If aplomado falcons are sighted, the applicant will need to comply with Section 6 of the lease terms which state:

*...Lessee may be required to complete minor inventories or short term special studies under guidelines provided by lessor. If in the conduct of operations, threatened or endangered species, objects of historic or scientific interest, or substantial unanticipated environmental effects are observed, lessee shall immediately contact lessor. Lessee shall cease any operations that would result in the destruction of such species or objects.*

#### **4.17 Visual Resources**

*Alternative B*: Visual impacts would be most pronounced during the active drilling phase of the project and would diminish when only low profile structures are left on-site. Minimizing the size and number of structures and utilization of the recommended earth tone colors would greatly reduce the visual impacts. Proper restoration/reclamation efforts would be essential to restore the visual balance to the area.

*Alternative C:* Impacts to visual resources under Alternative C would be the same as Alternative B.

#### **4.17.1 Mitigation**

The flat color Carlsbad Canyon (2.5Y 6/2) from the Standard Environmental Colors Chart will be used on all facilities to closely approximate the vegetation within the setting. All facilities, including the meter building, would be painted this color.

### **4.18 Recreation**

*Alternative B:* Although the proposed project area receives little direct recreational visitation, the recreational value of the land would be moderately diminished by the exploration and development of the area. People would tend to spend less time in an area that has lost a degree of naturalness and the feeling of remoteness. Sightseers, photographers, and birdwatchers would seek out other places that seem more natural. Many hunters would avoid using an area where conflicts may arise. Some visitors may not linger in an area that appears to be designated for other uses.

*Alternative C:* Impacts to recreation under Alternative C would be the same as Alternative B.

#### **4.18.1 Mitigation**

Minimizing the number and size of roads, structures, and bare ground will help to maintain the recreational appeal of the area. Proper restoration/reclamation efforts will also help in this regard. Restoration will take place as soon as areas are no longer needed.

### **4.19 Cumulative Impacts**

For purposes of assessing potential cumulative impacts that could be reasonably associated with the Proposed Action, an area of concern must be established. In this case the area of concern is assumed to be within the southwestern quarter of the Salt Basin Hydrologic Area (SBHA), which includes approximately 432 square miles or 276,480 acres surrounding the proposed well.

The legal description for the southwest quarter of the SBHA includes:

T. 24 S., R. 11 E.

T. 24 S., R. 12 E.

T. 24 S., R. 13 E.

T. 24 S., R. 14 E.

T. 25 S., R. 11 E.

T. 25 S., R. 12 E.

T. 25 S., R. 13 E.

T. 25 S., R. 14 E.

T. 26 S., R. 11 E.

T. 26 S., R. 12 E.

T. 26 S., R. 13 E.

T. 26 S., R. 14 E.

The SBHA is located in a remote region in which the predominant land use is livestock grazing. Due to the location of the SBHA, impacts to resources due to activities other than grazing or oil and gas development are highly unlikely. The remote nature of the region and lack of available private land precludes industrial or residential development. No oil and gas development is anticipated on private land due to the opposition of private landholders. Since livestock grazing is expected to continue at current levels for the foreseeable future, any future fluctuations in impact levels to resources will be due to the degree of oil and gas activity. At present, there are two producible but shut-in gas wells, the #1Y and the #25-1, located in the southwest quarter of the SBHA. Both are on Federal leases and were drilled in 1997 and 2001, respectively. An approximate acreage breakdown of land status in the southwest quarter of the SBHA includes:

Public Land open to exploration	152,963
Public Land currently under O&G lease	10,621
Public Land withdrawn in ACEC's	5,857
Public Land in Military withdrawal	16,940
State Land	51,300
State Land currently under O&G lease	36,324
Private Land	27,560
Private Land with Federal Mineral Estate	5,880

For purposes of analyzing potential cumulative impacts to the area of concern from oil and gas development, a Reasonably Foreseeable Development (RFD) scenario for the southwest quarter of the SBHA was developed. This RFD was prepared under the constraints of the Sierra and Otero Counties RMPA/FEIS, signed in 2005. The RMPA/FEIS requires that Federal leases be committed to unit agreements, and that no more than 5 percent of the lease acreage may be developed at any time.

#### **4.19.1 Reasonably Foreseeable Development**

##### **4.19.1.1 Introduction**

Oil and gas leasing on public land in the SBHA has declined markedly in recent years. Federal oil and gas leasing in the area has been withheld since 2005 pending resolution of a lawsuit by the State of New Mexico and environmental groups challenging the BLM's planning process. Leasing may resume at some time in the future following completion of litigation. A number of former Federal leases in the area have been allowed to expire by lessees or were terminated due to non-payment of royalties. All remaining oil and gas activity in the area has been limited to the Bennett Ranch Unit (BRU). The BRU is located in the south-central portion of the southwest quarter of the SBHA, specifically in T. 22 S., R. 12 and 13 E.

Of the existing wells in the area, the BRU No. 1Y well was completed on November 12, 1997. It had an initial potential of 1,294 Mcf of gas from the Mississippian Formation. A second well, the BRU No. 1-25, was completed on December 11, 2001. It had an initial potential of 3,000 Mcf from the Canyon Formation. Both wells were shut-in pending further drilling to determine the extent of the reservoirs, and establishment of reserves sufficient to justify construction of a pipeline.

##### **4.19.1.2 Oil and Gas Exploration Activity**

To date, there has been little oil and gas exploration activity in southern Otero County. PI/Dwights lists a total of 30 wells drilled in this area since 1929, with two-thirds drilled before 1970. Until the Harvey E. Yates Company (HEYCO) completed the BRU 1Y well in 1997, none of the wells had any shows of oil

or gas. In 1996, HEYCO applied for approval of the BRU. The unit area is just under 9,000 acres, located in T. 26 S., R. 12-13 E. HEYCO proposed the unit as a means of exploring a structural play within the Orogrande Basin. The proposed unit boundaries were based upon the interpreted extent of fault-bounded reservoir rock; the play was anticipated to be oil-charged.

Instead, the BRU No. 1Y well discovered gas in the Mississippian, at a depth of about 4,500 feet. Subsequent to this original discovery, a second well was drilled within the BRU. The BRU No. 1-25 was drilled to the Ordovician El Paso Formation, but discovered gas in the Canyon Formation at about 2,250 feet.

#### **4.19.1.3 Oil and Gas Development Activity**

The two BRU wells are the only potentially producing wells in the County. Both have been shut in since completion because of the lack of a pipeline to market the gas. The BLM believes both wells are capable of production in paying quantities. HEYCO has told the BLM that it needs to drill additional wells, and demonstrate additional gas reserves to justify construction of a pipeline to this remote area.

With so little drilling, and only two wells that are considered to be capable of production of methane gas in paying quantities (but have not yet produced), southern Otero County is still considered to be a wildcat prospect. It is likely that HEYCO would prefer to drill new wells in proximity to the existing BRU wells rather than drill a well in a remote area far from existing well control.

#### **4.19.1.4 Oil and Gas Development Potential**

This portion of southern Otero County has mature source rock and fault-bounded reservoir rock. Southern Otero County has 'medium' development potential for oil and/or methane, based upon the known producible wells.

#### **4.19.1.5 RFD Baseline Scenario Assumptions and Discussions**

##### The 1997 Sierra and Otero Counties RMPA RFD Scenario

This RFD forecasts the drilling of 141 wells in Sierra and Otero counties over a 20-year period. The forecast assumed the drilling of 39 frontier wildcat wells. Three of the 39 wells would have a significant show of oil or gas, resulting in four appraisal offsets wells being drilled (12 more wells).

The appraisal wells would lead to discovery of three gas fields covering 6 square miles each (six sections), developed on 320-acre spacing (2 wells per square mile or section), totaling 30 additional wells.

In addition, the RFD forecasts the discovery of three oil fields covering one square mile each (one section) developed on 40-acre spacing (16 wells per square mile or section) resulting in 60 additional oil wells. Overall, forecast well totals include 57 dry holes or subeconomic wells, and 84 producing oil or gas wells.

##### Subject Area of Concern Scenario

In the southwest quarter of the SBHA, the discovery of a gas field by the wells drilled within the area is assumed. Generally, when economically-recoverable production is discovered, operators will propose to drill additional wells in proximity to the discovery wells to delineate the reservoir. (This is the case with the proposed BRU #6 well which is located between the existing 1Y and 25-1 wells). Further drilling will normally continue until the reservoir boundaries have been established.

Based on historic patterns of leasing and development activity in the area of concern, it is reasonable to project that any future oil and gas development will occur on the public land remaining under lease at this time. This area amounts to some 10,621 acres in the area of the BRU. A total of 36,324 acres of State land is currently under lease for oil and gas in the area as well, but only one well has been drilled to date which was a dry hole. Full field gas development in this area, based on 320 acre spacing, would result in a total of 33 wells on Federal leases alone. However, the likelihood that the entire area overlies a continuous reservoir of recoverable natural gas is extremely remote. A more realistic estimate of producible wells would amount to perhaps one third that number or 11 wells. The probability of an oil discovery in the area appears to be low; however, it is reasonable to forecast the discovery of a small oil field with 4 additional delineation wells, developed on 40-acre spacing. This scenario leads to an assumption of a total of 15 wells on public land. Extension of the same level of development to State oil and gas leases assumes 51 wells on State land for a total of 66 wells overall.

#### **4.19.1.6 Surface Disturbance Due to Oil and Gas Activity**

It is likely that operators will drill any future wells to the Precambrian basement, at depths from 3,000-7,000 feet. This will require a 3.7 acre well pad, and perhaps 1 mile of temporary access road (3 acres per well). If production is not discovered, the well pad and access road will be reclaimed.

If production is discovered, the access road will be improved to all-weather conditions. The well pad will be reduced to the area needed for the wellhead and production facilities (an estimated 2 acres long term). Tanks may be constructed on site to hold produced fluids (oil and water). Oil production would likely be transported by truck to a refinery. Natural gas is piped to a gas plant. In this remote location, installation of a pipeline may not be feasible unless significant reserves of gas are discovered.

Produced water is likely to be saline, and not useful for irrigation or for livestock. For this reason, it would likely be reinjected into the same or a deeper horizon for disposal, by converting an existing dry hole to an injection well.

Short-term disturbance of 51 wells would be 188.7 acres for the drilling pads, and 153 acres for roads, for a total of 341.7 acres.

Long-term disturbance would be 5 acres per well (255 acres including roads). Because the RMPA requires coordinated development of drilling and construction of facilities, gas collection lines will run from the well head to a single trunk line. Where possible, the collection lines would lie within the road right-of-way. It is estimated that there will be a total of 6 miles of collection lines, within a 25-foot right-of-way (18 acres). The trunk pipeline to a gas plant will be 10 miles long within a 50-foot right-of-way (61 acres). Total long-term disturbance is 159 acres. ***The total long-term surface disturbance anticipated to be a result of oil and gas development amounts to 414 acres or 0.15 percent of the entire SBHA area of approximately 276,480 acres.***

Air quality impacts would be temporary in nature and due to pollution from exhaust emissions, chemical odors, and dust that would be caused by the motorized equipment used to construct the well pads, reserve pits or tanks, and by the rotary drilling rig itself. There are currently over 26 miles of existing roads in the BRU alone and although new access roads would be needed, most traffic to and from drill sites would use existing dirt roads in the area. Dust dissemination would be greatly reduced upon the completion of construction of the well pads and other infrastructure. Air pollution from the motorized heavy equipment would discontinue entirely upon completion of well drilling. The RMPA quantifies fugitive dust emissions expected to result from drilling activities in terms of total suspended particulates (TSP). TSP is estimated at approximately 10 tons per well during a 30-day per well pad construction and drilling period.

#### **4.19.1.7 Cumulative Impacts to Resources**

Water requirements for fluid minerals development at the levels anticipated would be limited and are not anticipated to cause any impacts to the groundwater supply. Water table declines are monitored by the Office of the State Engineer, and the water right allotment and well permit system are in place to ensure that all interested parties have access to their allotted water. Measures to protect the aquifer from contamination due to oil and gas development activities will continue in place. These measures are adequate to prevent degradation of the water supply, and no cumulative effects to groundwater are anticipated.

Contamination of the aquifer due to oil and gas development resulting from surface spills or well bore leakage is a remote possibility, however BLM stipulations, Conditions of Approval and Best Management Practice will be strictly enforced, and no impacts to ground or surface water are expected in the near or long term.

Of 276,480 total acres in the SBHA, only 414 acres or 0.15 percent of the existing vegetation would be lost in the long-term due to surface disturbance from oil and gas development. This level of impact is not expected to have any serious lasting effect on plant species distribution, populations or reproduction. Best Management Practices would continue in effect throughout the productive life of any development that may occur and will prevent any increases in the spread of noxious weeds in the area.

Approximately 160,000 acres of public land are leased for grazing in the SBHA. The loss of 414 acres to oil and gas development at current stocking levels would result in the long-term loss of approximately 6 to 7 animal unit months (AUMs) on Federal allotments. Grazing on State and private lands would be unaffected by oil and gas development.

The actual loss of wildlife habitat due to oil and gas development would be minor as viewed on the basis of disturbance acreage, however, the linear nature of some disturbance may increase the severity of adverse impacts. The amount of road development required would not be large relative to the existing road network; however, the density or location of new access roads may have a cumulative effect on previously undisturbed areas. In particular, the possibility exists that cumulative direct and indirect effects may be notable in terms of habitat fragmentation for larger wildlife.

Due to the absence of regulatory requirements to measure GHG emissions and the variability of oil and gas activities on Federal minerals, it is not possible to accurately quantify potential GHG emissions as a result of the anticipated level of future development. The amount of GHG emissions expected would represent a small, incremental contribution to the total emissions worldwide. This small incremental contribution to global GHG gases cannot be translated into incremental effects on climate change globally or in the area of this site-specific action. As oil and gas and natural gas production technology continues to improve in the future, one assumption is that it may be feasible to further reduce GHG emissions.

The lack of scientific tools designed to predict climate change on regional or local scales limits the ability to quantify potential future impacts. However, potential impacts to natural resources and plant and animal species due to climate change are likely to be varied, including the southwestern United States. For example, if global climate change results in a warmer and drier climate, increased particulate matter impacts could occur due to increased windblown dust from drier and less stable soils. Cool season plant species' spatial ranges are predicted to move north and to higher elevations, and extinction of endemic threatened/endangered plants may be accelerated. Due to loss of habitat or competition from other species whose ranges may shift northward, the population of some animal species may be reduced or increased. Less snow at lower elevations would likely impact the timing and quantity of snowmelt, which, in turn, could impact water resources and species dependant on historic water conditions. Forests

in New Mexico and the Southwest that are currently stressed by drought may be impacted more by climate change. In the Southwest, increasing levels of CO2 and changing patterns of precipitation may also facilitate the spread of woody species in grasslands. Drought sensitive species, particularly in the higher elevations in New Mexico, have been identified, and may be more susceptible to climate change.

**4.19.1.8 Mitigation**

The BLM will incorporate appropriate Best Management Practices (BMPs) as Conditions of Approval for the subject APD as well as any future proposed oil and gas related actions. BMPs are innovative, dynamic, and economically feasible mitigation measures applied on a site-specific basis to reduce, prevent, or avoid adverse environmental or social impacts. BMPs are applied to management actions for the purpose of achieving desired outcomes for safe, environmentally sound resource development by preventing, minimizing, or mitigating adverse impacts and reducing conflicts. The early incorporation of BMPs into APDs by the oil and gas operator helps to ensure an efficient and timely APD process. BMPs set standards for minimizing adverse effects resulting from the construction of facilities and infrastructure, which should mitigate potential cumulative impacts and habitat fragmentation. The BLM has developed BMPs specific to public land management in Otero County. These BMPs are listed in Appendix C of the RMPA.

**5.0 CONSULTATION/COORDINATION**

**5.0.1 Comments Received**

**TABLE 5.1 SUMMARY OF PUBLIC CONTACTS MADE DURING PREPARATION OF DRAFT EA**

<b>PUBLIC CONTACT</b>	<b>TITLE</b>	<b>ORGANIZATION</b>	<b>PRESENT AT ONSITE?</b>
Arturo Sinclair	Governor	Ysleta Del Sur Pueblo	Not present
Carlos Hisa	Lt. Governor	Ysleta Del Sur Pueblo	Not present
Ron Curry	Cabinet Secretary	New Mexico Environment Department	Not present
Lisa Kirkpatrick	Chief	Conservation Services Division, New Mexico Dept. of Game and Fish	Not Present
Glen Landers	Private Citizen	N/A	Present
Joanna Prukop	Cabinet Secretary	New Mexico Energy, Minerals and Natural Resources Dept.	Not present
Ruth Burstrom	President	New Mexico Audubon Council	Not present
Nada Culver	Senior Counsel	The Wilderness Society	Not present
Katherine Slick	State Historic Preservation Officer	New Mexico State Historic Preservation Office	Not Present

An initial public scoping letter identifying the proposed drilling project and soliciting comments was distributed by mail to interested parties on December 13, 2006. Responses were received from persons and organizations listed in Table 5.1. All comments received were considered and incorporated into the initial draft EA as appropriate. An additional 30-day public scoping period followed completion of the draft EA beginning on November 7, 2007, and further comments were received from individuals and organizations listed in Table 5.2. A number of the comments received were incorporated into this document.

In addition to the organizations in the above table, comments were received via fax and email from approximately 340 private citizens.

*See Appendix A-1 for a summary of public comments.*

<b>TABLE 5.2 SUMMARY OF PUBLIC CONTACTS MADE DURING PREPARATION OF FINAL EA</b>		
<b>PUBLIC CONTACT</b>	<b>TITLE</b>	<b>ORGANIZATION</b>
Joanna Prukop	Cabinet Secretary	New Mexico Energy, Minerals and Natural Resources Department
Nada Culver	Senior Council	The Wilderness Society
Ron Curry	Cabinet Secretary	New Mexico Environment Department
Matthew Wunder	Chief	Conservation Services Division, New Mexico Dept. of Game and Fish
Stephen Capra	Executive Director	New Mexico Wilderness Alliance
Kevin Bixby	Executive Director	Southwest Environmental Center
Jeff Bingaman	U.S. Senator	State of New Mexico
Ray Backstrum	Interim County Administrator	Otero County
Katherine Slick	State Historic Preservation Officer	New Mexico State Historic Preservation Office
Stephen P. Cook	Representative	South Sacramento Water Group
Sanford D. Schemnitz	Chairman	Southwest Consolidated Sportsmen
Wally Murphy	Field Supervisor	Fish and Wildlife Service
Clifford K. Larsen	Mining Issues Chair	Rio Grande Chapter of the Sierra Club,
John R. D'Antonio	State Engineer	State of New Mexico
George M. Yates	President	Harvey E. Yates Company

## 5.1 Interdisciplinary Team

Team Member	Title	Organization	Present at Onsite?
John Besse	Environmental Protection Specialist	Las Cruces DO	Present
Lisa Phillips	Range Management Specialist	Las Cruces DO	Not Present
Mark Hakkila	Wildlife Biologist	Las Cruces DO	Present
Tom Holcomb	Archaeologist	Las Cruces DO	Not Present
Bruce Call	Soil Scientist	Las Cruces DO	Present
Oz Gomez	Outdoor Recreation Planner	Las Cruces DO	Not Present
John Simitz	Geologist	Roswell FO	Not Present

## 6.0 REFERENCES

U.S. Department of the Interior, Bureau of Land Management. White Sands Resource Management Plan Las Cruces, New Mexico: Las Cruces District Office, October 1986.

U.S. Department of the Interior, Bureau of Land Management. Proposed Resource Management Plan Amendment/Final Environmental Impact Statement (RMPA/FEIS) for Federal Fluid Minerals Leasing and Development in Sierra and Otero Counties Las Cruces, New Mexico: Las Cruces District Office, December 2003.

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EPA, Natural Gas Star Program (2006 data) at: <http://www.epa.gov/gasstar/accomplish.htm>. Environmental Protection Agency, Washington, D.C.

Enquist, Carolyn and Gori, Dave. Implications of Recent Climate Change on Conservation Priorities in New Mexico. April 2008.

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Intergovernmental Panel on Climate Change (IPCC). 2007. Climate Change 2007: The Physical Basis (Summary for Policymakers). Cambridge University Press. Cambridge, England and New York, New York. (Available on the Internet: <http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-spm.pdf>)

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National Academy of Sciences. 2006. Understanding and Responding to Climate Change: Highlights of National Academies Reports. Division on Earth and Life Studies. National Academy of Sciences. Washington, D.C. (Available on the Internet: <http://dels.nas.edu/basc/Climate-HIGH.pdf>.)

US Government Accountability Office Report "Climate Change, Agencies Should Develop Guidance for Addressing the Effects on Federal Land and Water Resources" GAO-07-863, August 2007 (1st paragraph, 1st page, GAO Highlights) at: <http://www.gao.gov/news.items/d07863.pdf>

## **7.0 APPENDICES**

### **7.1 APD**

The Bennett Ranch Unit #6 APD is available for review in the Las Cruces District Office. Map 1 in this EA shows the location of the proposed well.

#### **7.1.1 Authorities**

40 CFR, All Parts and Sections inclusive Protection of Environment, Revised as of July 1, 2006.  
43 CFR, All Parts and Sections inclusive - Public Lands: Interior. Revised as of October 1, 2000.  
U.S. Department of the Interior, Bureau of Land Management and Office of the Solicitor (editors). 2001.  
The Federal Land Policy and Management Act, as amended. Public Law 94-579.

#### **7.1.2 Other Supporting Information**

##### **7.1.2.1 Conditions of Approval**

OPERATOR: Harvey E. Yates Company  
LEASE NO: NM-71526  
WELL NAME & NO.: Bennett Ranch Unit #6  
LOCATION: Section 24, T. 26 S., R. 12 E., NMPM.  
QUARTER/QUARTER & FOOTAGE: NW¼SW¼ - 660 feet FWL & 1140 feet FSL  
COUNTY: Otero County, New Mexico

1. The Harvey E. Yates Company shall hereafter be identified as the operator in these requirements. The Authorized Officer is the person who approves the Conditions of Approval.
2. The operator shall indemnify the United States against any liability for damage to life or property arising from occupancy or use of public land under this authorization.
3. The operator shall have surface use approval prior to any construction work on change(s) or modification(s) to the access road and/or well pad. The operator shall submit (Form 3160-5), Sundry Notice and Report On Wells, an original plus one (1) copy to the Roswell Field Office, stating the basis for any changes to previously approved plans. Prior to any revised construction, the holder shall have an approved Sundry Notice and Report on Wells or written authorization to proceed with the change in plans ratified by the Authorized Officer.
4. Weed Control:
  - A. The operator shall be held responsible if noxious weeds become established within the area. Evaluation of the growth of noxious weeds shall be made upon discovery. Weed control will be required on the disturbed land where noxious weeds exist, which includes the roads, pads, associated pipelines, and adjacent land affected by the establishment of weeds due to this action. The holder is responsible for consultation with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policy.
  - B. The operator shall insure that the equipment or vehicles that will be used to construct, maintain and administer the access roads, well pad and resulting well are not transporting invasive and noxious weed seed. Transporting of invasive and noxious weed seed could occur if the equipment and

vehicles were previously used in noxious weed infested areas. In order to prevent the spread of noxious weeds, the Authorized Officer shall require that the equipment and vehicles be cleaned with either high pressure water or air prior to moving the equipment to the site of construction, maintenance and administration of the access roads, well pad, and resulting well.

5. Hazardous Substances:

A. The holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder shall comply with the Toxic Substances Control Act Of 1976, as amended (15 U.S.C. 2601, *et. seg.*) with regard to any toxic substances that are used, generated by or stored on the project/pipeline route or on facilities authorized. (See 40 CFR, Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193). Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation and Liability Act, Section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the Authorized Officer concurrent with the filing of the reports to the involved Federal agency or State government.

B. The holder agrees to indemnify the United States against any liability arising from the release of any hazardous substances or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, *et. seg.* or the Resource Conservation and Recovery Act, 42 U.S.C. 6901, *et. seg.*) on this project/pipeline (unless the release or threatened release is wholly unrelated to the holder's activity on the pipeline). This agreement applies without regard to whether a release is caused by the operator, its agent, or unrelated third parties.

C. Leaking equipment will be promptly repaired or removed from the site to prevent contamination from spills. Any soil or water that has been contaminated will be placed in appropriate containers and removed from the site. Disposal of vehicle fluids on public land will not be authorized.

D. Copies of spill prevention, control, and countermeasure plans are required, and must be provided to the Authorized Officer.

E. Use of pesticides and herbicides shall comply with applicable Federal and State laws. Prior to use of pesticides, the BLM Authorized Officer will approve a plan for its use.

F. Storage tanks will have a berm constructed around them, of sufficient dimensions to contain the contents of the largest tank, to serve as secondary containment should a spill occur.

G. The concentration of hazardous substances in the reserve pit at the time of pit backfilling must not exceed the standards set forth in the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA).

H. All drilling-related CERCLA hazardous substances removed from the location and not reused at another drilling location must be disposed of in accordance with applicable Federal and State regulations.

I. All pits and tanks containing liquids or semi-liquids, including drilling and workover pits, will be covered with non-monofilament small mesh netting which extends to ground level to prevent the entrapment or contamination of wildlife. Netting shall be in place at all times when workers are not actually present at the site.

J. Reserve pits, if used, shall be lined with BLM approved materials and shall be surrounded by a BLM approved 4 strand barb wire fence to exclude livestock.

6. Well Pad Construction:

A. Construction must conform to the approved well site and layout plan in the Surface Use Plan of Operations (SUPO).

B. All topsoil shall be removed from the area to be disturbed and stockpiled for reapplication during reclamation.

C. The total surface area disturbed for construction of the well pad shall be limited to the absolute minimum required subject to the approval of the Authorized Officer. Upon completion of the well, the pad shall be reduced to the minimum area necessary for production and the remainder reclaimed.

D. Control measures (water bars, slope reduction, recontouring, terracing etc.) shall be utilized as necessary to prevent erosion of soil disturbed by construction of the well pad.

E. Reserve pits, if used, shall be constructed in 100 percent cut material at a depth which will allow for at least 3 feet of cover when the pad is recontoured to original grade.

F. Aboveground structures shall be painted to blend with the natural color of the landscape. A flat color from the Standard Environmental Colors Chart specified by the Authorized Officer shall be used on all facilities to closely approximate the vegetation within the setting.

G. The operator shall notify the BLM 15 days notice prior to commencing work at the site to provide for a pre-construction aplomado falcon survey.

7. Interim Well Pad Reclamation:

A. Following completion of a producing well, the well pad shall be reduced in size to the minimum area required for actual operation of the well. Caliche shall be removed from the balance of the disturbed area followed by recontouring and topsoil reapplication. Seeding will be accomplished prior to the beginning of the next growing season.

B. Reserve pits, if used, shall be dry prior to backfilling and pit contents shall not exceed CERCLA standards for hazardous substances.

C. Pit shall be covered with a minimum of 3 feet of fill and mounded to facilitate drainage and allow for settling.

D. Seeded areas shall be fenced to exclude cattle for the duration of the revegetation process.

8. Well Pad Abandonment:

A. All surface structures including tanks, poles, powerlines etc., shall be removed upon abandonment, relinquishment or termination of use.

- B. Proper disposal methods for debris and other trash including all toxic products shall be followed.
- C. Wells shall be plugged in accordance with BLM and New Mexico State requirements.
- D. All caliche applied for surfacing during construction/operation shall be removed from the site prior to recontouring. Caliche may be recovered and reused for road maintenance or other beneficial use.
- E. The disturbed area shall be restored to original pre-disturbance contours and stockpiled topsoil reapplied prior to reseeding.
- F. The entire disturbed area shall be fenced to exclude cattle for the duration of the revegetation process

9. Seed Mixes:

The operator shall use a BLM prescribed seed mix the composition of which will be determined according to soil and range type.

10. Dust Control:

The operator shall utilize all means necessary to control surface erosion and airborne dust emissions from the site during construction and operation. Dust abatement measures shall include water application and avoiding construction activity during periods of high winds.

11. Reclamation Standards:

The operator shall be responsible for successful completion of reclamation to BLM standards and reclamation success will be evaluated using performance based standards. Reclamation will be considered successful when healthy, mature perennials are established with a composition and density that closely approximates the surrounding vegetation as prescribed by the BLM, and the reclamation area is free of noxious weeds. Parameters will include percent basal cover of mature approved species as compared to an adjacent undisturbed area. Timeframes for release will be at least 2 years. Operators shall use any BLM approved means necessary to achieve acceptable revegetation including, but not limited to:

- Importation of additional topsoil if stockpiled topsoil from the site proves insufficient in quantity or quality.
- Irrigation if rainfall during the growing season proves insufficient to sustain plant growth.
- Mulching to control wind erosion, evaporative water loss and seed loss.

Operators shall make every effort to accomplish reclamation of the site within two growing seasons. If revegetation is not acceptable at the end of that timeframe more intensive reclamation methods may be required by the Authorized Officer.

Under no circumstances will the operator be released from responsibility for reclamation until the site is determined to be fully recovered by the Authorized Officer based on BLM standards. Reclamation efforts by the operator shall continue for as long as required to achieve full recovery.

12. Archaeological, Paleontology, and Historical Sites:

A. Any cultural or paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on the holder's behalf, on public or Federal land shall be immediately reported to the Authorized Officer. The holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder shall be responsible for the cost of evaluation and any decision as to the proper mitigation measures will be made by the Authorized Officer after consulting with the holder.

B. The holder is hereby obligated to comply with procedures established in the Native American Graves Protection and Repatriation Act (NAGPRA) to protect such cultural items as human remains, associated funerary objects, sacred objects, and objects of cultural patrimony discovered inadvertently during the course of project implementation. In the event that any of the cultural items listed above are discovered during the course of the project work, the holder shall immediately halt the disturbance and contact the BLM within 24 hours for instructions. The holder or initiator of any project shall be held responsible for protecting, evaluating, reporting, excavating, treating, and disposing of these cultural items according to the procedures established by the BLM in consultation with Indian Tribes. Any unauthorized collection or disturbance of cultural resources may result in a shutdown order by the Authorized Officer.

13. Sanitation:

The holder shall be responsible for maintaining the site in a sanitary condition at all times; waste materials shall be disposed of promptly at an appropriate waste disposal site. "Waste" means all discarded matter including, but not limited to, human waste, trash, garbage, refuse, oil drums, petroleum products, ashes, and equipment.

14. Open-top Tanks:

Any open-top tank containing oil or toxic fluids shall be covered with netting or equipped to prevent birds, bats, and other wildlife from entering the open-top tank.

15. Undesirable Events:

If, during any phase of the construction, operation, maintenance, or termination of the authorization, any oil or other pollutants, should be discharged, and impacting Federal land, the control and total removal, disposal, and cleaning up of such oil or other pollutants, wherever found, shall be the responsibility of the holder, regardless of fault. Upon failure of the holder to control, dispose of, or clean up such discharge on or affecting Federal land, or to repair all damages to Federal land resulting there from, the Authorized Officer may take such measures as deemed necessary to control and cleanup.

## 7.2 APPENDIX A-1 SUMMARY OF PUBLIC COMMENTS

1. **The APD is premised on the improper assumption that HEYCO will obtain a waiver from applicable rules; the APD should compliance with the New Mexico Oil Conservation Commission's Rule 21.**

In the EA, the BLM takes no position as to the probability of a Rule 21 waiver being granted by the New Mexico Oil Conservation Division (NMOCD) in this case. Where appropriate, the EA considers impacts of both the use of steel tanks and a lined earthen pit during drilling. In Section 1.3 of the EA, the Operator is explicitly required to: (1) Obtain a waiver from NMOCD (Rule 21 waiver) if a reserve pit (lined earthen pit) is to be used, and (2) to comply with all applicable Federal, State and local laws and regulations.

2. **The BLM has the authority to deny the APD; the EA should thoroughly assess an alternative denying the APD.**

The EA presents the No Action Alternative as a baseline for the analysis if the resource impacts of the other alternatives (Alternative B and Alternative C). Under the No Action Alternative, the APD would be denied and the proposed well would not be drilled. There would be no impacts to resources in the area under the No Action Alternative and therefore no impacts to analyze. The No Action Alternative would be selected should Alternative B and Alternative C be rejected.

3. **The BLM has the authority to require directional drilling from the existing wells; the EA should thoroughly assess an alternative requiring HEYCO to drill the proposed well from an existing wellpad.**

As a result of this comment, a directional drilling alternative was included in the EA. Directional drilling was considered but not analyzed further due to technical difficulties that render the method impractical in this instance. For a full discussion of the directional drilling analysis, see section 2.4.

4. **The APD should require a survey of the presence and depths of groundwater and specify additional protective measures and/or BLM should delay action on oil and gas drilling proposals on Otero Mesa pending completion of further Salt Basin Aquifer studies.**

In 2006, the United States Geological Survey issued Open File Report 2006-1358, titled Knowledge and Understanding of the Hydrology of the Salt Basin in South-central New Mexico and Future Study Needs. This report, along with the Livingston Associates/John Shomaker and Associates report, provided basic information concerning the area of the Salt Basin, its aquifers, its recharge area and discharge locations.

We believe that there is already good information for the depth to aquifers in the Salt Basin. There are shallow aquifers above (shallower than) HEYCO's target formation, as well as deeper aquifers. What is not known with confidence is the potential volumes of available groundwater or its chemistry (which could affect its usability) in different portions of the Salt Basin. Our drilling and casing plan is designed to protect these known aquifers. We believe that the surface use and drilling plans are fully adequate to prevent contamination and degradation of the aquifers.

**5. BLM should impose stringent survey requirements, subsequent mitigation and recovery measures for protection of Aplomado falcons.**

The northern aplomado falcon habitat model indicates that the proposed development would be in high potential habitat for aplomado falcons. Surveys for aplomado falcons have been conducted during the breeding season by two separate contract biologists for the past several years. The proposed well site is adjacent to an established survey route.

The EA contains a number of mitigation measures designed to minimize impacts to aplomado falcon habitat including:

- Minimize pad size as much as possible
- Net any open pits to prevent bird mortality
- Locate the pad away from potential nest sites (tall, multi-branched yuccas and tree-form mesquites with raptor nests)
- Conduct surveys for aplomado falcons
- Conduct further NEPA analysis and Section 7 Conference for commercial production proposals

For detailed discussion of potential impacts to aplomado falcons and mitigation measures, see section 4.16 of the EA.

**6. BLM should impose re-vegetation requirements to protect Chihuahuan desert grasslands and ensure that they will be successful before approving this permit.**

The EA imposes very stringent reclamation measures that go well beyond typical requirements for an action of this type. These requirements will be attached to any authorization of the APD as conditions of approval (COAs). Refer to section 6.1.3.1 for a complete listing of the Conditions of Approval for the BRU #6 APD.

**7. The EA should assess the benefits for the Butterfield Historic Trail of denying the APD or requiring directional drilling.**

Effects to the Butterfield Historic Trail are assessed in the EA. The well location as proposed (Alternative B) is within the controlled surface use area which was established .25 miles on either side of the Butterfield Trail in the 2005 RMPA. According to 43 CFR 3101.1-2, the BLM has the authority to require relocation of proposed operation by a maximum of 200 meters as a condition of approval for the APD. By moving the location 200 meters to the south-southeast, all surface disturbance would occur outside the Butterfield Trail controlled surface use area. This action is analyzed in the EA as Alternative C and would be in full conformance with 2005 RMPA objectives for protecting the cultural values of the Butterfield Trail. Refer to section 4.3 of the EA for a detailed discussion.

8. **A quantification of the anticipated emissions of pollutants (VOC's, Nitrogen Oxides, Hydrogen Sulfide) and determination of whether ambient air quality standards will be met should be included in the EA.**

Oil and gas exploration and development generate greenhouse gases during all phases of the process. Combustion of gasoline and diesel fuels from vehicles used during construction of the access road and well pad will generate CO<sub>2</sub>, N<sub>2</sub>O among other emissions. The diesel-powered drilling rig will generate CO<sub>2</sub>, N<sub>2</sub>O and particulates during drilling. The use of low-sulfur diesel fuels will minimize the emission of sulfur dioxide. HEYCO cannot vent or flare the produced gas without approval. That should reduce the likelihood for significant emissions of VOCs and CO<sub>2</sub>.

The two BRU wells already completed have yielded only 'sweet' gas. We do not anticipate any emissions of hydrogen sulfide during the drilling of the BRU #6 well, or during the production phase, if the well recovers natural gas in paying quantities.

**DEPARTMENT OF THE INTERIOR  
Bureau of Land Management  
Las Cruces District Office  
1800 Marquess Street  
Las Cruces, New Mexico 88005**

**PROJECT: EA #NM-030-2006-161**  
**LOCATION: Lease #NM-71526**  
**APPLICANT: Harvey E. Yates Company**  
**BLM OFFICE: Las Cruces District Office**

**FINDING OF NO SIGNIFICANT IMPACT**

Impact identification and analysis of approving the project proposal and/or alternative(s) has been completed. A complete and comprehensive environmental analysis has been conducted. Completion of the environmental assessment (EA) (see Attachment #1), along with implementation of required stipulations and/or mitigating measures outlined in the EA and Application for Permit to Drill (APD) conditions of approval, will result in impacted resources values being restored to pre-project conditions and/or acceptable post-project standards. Further analysis in an environmental impact statement is not needed.

**DECISION RECORD**

Based upon the analysis, Alternative C has been selected. Alternative C requires relocation of the pad from the proposed location to a point 200 meters to the south-southwest. With the above relocation, the proposed Bennett Ranch Unit #6 well, located in T. 26 S., R. 12 E., Section 24 is approved. The total disturbance for this project will be 3.7 acres with 1.5 acres being rehabilitated and reseeded within 120 days of completion of the project. This decision incorporates mitigation measures outlined in the preferred alternative of the EA, lease stipulations and APD conditions of approval, which will mitigate the unavoidable long and short-term impacts of this action.

**RATIONALE**

The amount of new long-term disturbance will be limited to the well pad. No new access roads or pipelines are required or authorized at this time. Short-term impacts will last approximately one growing season or until there is successful plant growth on the rehabilitated portion.

The Bureau of Land Management staff has reviewed the EA and identified site-specific mitigation measures to avoid or minimize surface impacts resulting from the construction of this project. The well pad will remain as a long-term impact. The cumulative impacts to the environment from existing and new development have been identified. During construction activities, machinery emissions, disturbed ground, drilling and construction equipment will result in short-term visual impacts. These impacts will be minimized by a rapid construction schedule and site restoration.

The Bureau of Land Management has developed a visual resource management (VRM) classification system designed to enhance visual qualities and describe degrees of modification to the landscape. The proposed project area is classified as VRM Class IV. VRM Class IV allows for major modifications of the existing landscape and the level of change in the basic landscape from this management level can be high.

A cultural and historic resource category 3 inventory was conducted for the area of potential effect (APE) of this project as proposed. This is documented in *Class III Cultural Resources Inventory of 11.38 Acres near Alamo Mountain, Otero County, New Mexico, for the Bennett Ranch Unit #6 Well pad*. No cultural resources were encountered within the APE as proposed.

The operator will be allowed to drill this well as part of the further development of, and in accordance with, terms of their Federal lease.

A bond is required for all Federal leases. The bond must guarantee performance and compliance with the lease terms and cover all liabilities arising from, or related to drilling operations on a Federal lease including the restoration of any lands or surface waters adversely affected by lease development.

Production history on Otero Mesa has demonstrated that there are no unique or unknown risks. The effects of oil and gas exploration and production are known, and based on experience, mitigation measures and stipulations have been developed to avoid, minimize or eliminate impacts.

The proposed project is highly controversial. The local ranching community is not supportive of oil and gas development in the area nor is the State of New Mexico. There is opposition to the project from Otero County and from a number of environmental groups as well. However, based on the reasoned analysis contained in the EA, there will be no significant effects to the quality of the human environment resulting from this action.

Secondary effects on soils, erosion, vegetation, cultural resources, wildlife habitat, and recreation resources were considered. Partial reclamation will occur during the production phase and full reclamation will occur after final abandonment. Residual impacts that remain after mitigation measures and implemented are found acceptable.

This proposed action is in compliance with the *Resource Management Plan Amendment for Federal Fluid Minerals Leasing in Sierra and Otero Counties* that was approved January 24, 2005. This plan was reviewed to determine if the proposed action conformed to land-use planning terms and conditions required by 43 CFR 1610.5. No land-use planning or zoning exists in Otero County that will affect this action.

## **STIPULATIONS**

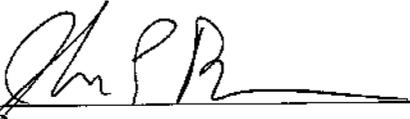
Mitigating measures and/or stipulations were considered and analyzed in the EA. Based on impact analysis, specific stipulations and/or mitigating measures have been selected and are attached as Conditions of Approval to the approved APD. The applicant is responsible for implementing these stipulations to prevent and/or reduce impacts projected to occur during and after project completion.

## ADMINISTRATIVE REVIEW AND APPEAL

Under BLM regulations, this Decision Record (DR) is subject to administrative review in accordance with 43 CFR 3165. Any request for administrative review of this DR must include information required under 43 CFR 3165.3(b) (State Director Review), including all supporting documentation. Such a request must be filed in writing with the State Director, Bureau of Land Management, 1474 Rodeo Road, Santa Fe, NM 87505, no later than 20 business days after this DR is received or considered to have been received.

Any party who is adversely affected by the State Director's decision may appeal that decision to the Interior Board of Land Appeals, as provided in 43 CFR 3165.4.

Prepared by:

 Date 9/25/08  
John Besse  
Environmental Protection Specialist

Approved by:

 Date 9-25-08  
Tim L. Sanders  
Assistant District Manager  
Division of Multi-Resources